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A JOURNEY ACROSS TIBET.*

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In 1890 I returned from Turkistan, after an absence of fourteen months, thoroughly bitten with that love of travel which comes to all who have once experienced the charm of wandering amidst strange peoples in unknown lands. The biggest blank on our maps of Asia was in Tibet. The southern and eastern parts were partially known through the explorations of various native surveyors; but north of Nain Singh's route, as far as Chinese Turkistan, absolutely nothing was known. A few conjectural lakes were dotted about our maps, but these seemed to have been put in to satisfy the artistic taste of map designers, so if permission could be obtained, I determined to endeavour to cross that unknown stretch of country. Their Excellencies the Viceroy and the Commander-in-Chief gave the scheme their warmest approbation, and Dr. W. G. Thorold, of the Indian Medical Service, having volunteered to accompany me, I left Simla for Kashmir to make arrangements.

On starting for an unknown country it is often a difficult thing to decide as to what transport is the most suitable. Yaks, which are largely used in crossing the high passes of the Himalayas, have the advantage of being almost insensible to cold, and are not much affected by altitude; but the disadvantages are, that they march very slowly, are liable to get footsore, and will not eat grain; therefore they cannot be taken to any place where grass is not obtainable. Sheep are useful, and can carry a load of from 30 to 40 lbs.; but, owing to the winter having been an exceptionally severe one and the spring having been backward, none in sufficiently good condition to start on a long journey were obtainable. I had therefore to content myself with ponies and mules.

My time at Kashmir was very fully taken up in buying animals and clothes, fitting pack-saddles, &c.; but at last, on April 17th, 1891, I

* Read at the meeting of the Royal Geographical Society, February 20th, 1893. Map, p. 480.

was able to set out for Leh, whence the final start was to be made; Dr. Thorold had already gone on. On the road the Zoji La Pass had to be crossed. Though only 11,300 feet high, it was rather difficult to get over, as a great deal of soft snow was lying, and our baggage had to be made into very small parcels and carried by coolies; while the ponies, on which there were no loads, were assisted by men, one being told off for each pony. After crossing the pass we entered Ladakh, and, before long, monasteries, praying wheels, and heaps of stones with sacred inscriptions, brought home to us the fact that we were in a Buddhist country. Leh was reached on June 1st, and we halted there until the 14th, making final preparations for our start into the unknown.

The party marching out of Leh consisted of Dr. Thorold and myself, a native sub-surveyor, my Pathan orderly, a Hindustani cook, a Kashmiri, and six Arghoon caravan drivers. On the road we paid a flying visit to Hemis Monastery, as the annual festival was going on there, and had an opportunity of seeing a Lama masked dance. This was one of the quaintest and weirdest sights I have ever seen. Round and round went these hideously-masked figures in slow measured time, while a hidden choir chanted in true cathedral style.

The Buddhist religion as seen in Tibetan countries has nothing in common with the pure morality preached by Gautama Buddha. The doctrines of the founder are too abstract for the average Tibetan mind, and this has led to innovations which have developed until the grossest superstition, little better than African fetishism, and bearing hardly any resemblance to the original precepts, is all one meets in the stronghold of Buddhism.

From Hemis we went to Chang Chemmo, where we picked up the depot of supplies that had been sent on, and then continued our way towards the Lanak La Pass. At first I thought we would have had difficulty in finding it, as a man who had been enlisted on his having offered to guide us there turned out to be totally ignorant of its position, and confessed that he had never been there. However, a Ladakhi, who had come with some hired transport, said he knew where it was, and being promised a reward, agreed to show us. Under his guidance we reached it, and crossed the frontier on July 3rd. The Kashmiri was completely knocked up from mountain sickness on the road and had to be sent back.

After crossing the frontier we kept on in an easterly direction to the Mangtza Cho Lake, which we reached on July 7th. The lake is a fine sheet of water of a deep indigo-blue, lying at an elevation of 16,540 feet. The water is salt, and the Tibetans come from Ladakh and Noh to gather the salt which is found in incrustations round the edge. We were fortunate in meeting no one, as had we met any of the inhabitants they would most assuredly have objected to our going further into their country, and difficulties might have arisen.

After leaving the lakes we kept on in an easterly direction up a wide open valley. Away to the north, standing out in the clear atmosphere and sparkling in the bright sunshine, magnificent snowfields were to be seen, while in front of us a range running north and south appeared to block the way completely. The Ladakhi, who had agreed to take us five marches further on, wanted to return; he said he was utterly ignorant of where we were or where we were likely to get to. However, when he discovered that he was to be held to his bargain, and would have to go on, whether he knew the road or not, he took the guidance of the caravan, and led us over the apparently formidable obstacle by a pass which, though 18,400 feet high, was still very easy. Descending the pass we found ourselves on the banks of a large lake, with several islands dotted about its surface, lying at an altitude of 17,930 feet, the highest lake we found in Tibet, and probably the highest in the world. To the south, a snowclad range, and on the other side low undulating hills were seen. Owing to the fact that the streams coming down from the snows enter at the south, the water at that end is much fresher than at the other; and as is invariably the case when fresh water is met with in these regions, gulls, bar-headed geese, and Brahminy ducks wheeling in the air uttering their discordant cries, gave life and animation to the scene. Leaving this lake behind we kept on, and in two days' time came to another large lake, close to which, finding a ravine containing fresh water and abundance of grass, I decided to halt for a day in order to rest the ponies. Here, as on many occasions, I found myself deceived as regards distance by the clear atmosphere. Thinking the lake to be about 3 miles distant I started for it, taking the necessary instruments to ascertain the altitude of its surface; but imagine my disgust to find that instead of being 3 miles off it was really about 9.

Next day we continued our way eastwards, and a very long, weary day it was. There was no water on the road, and in the afternoon the poor animals kept rushing into every watercourse, only to find them dry. Darkness came on before we had found any water, and convinced that wandering on in the dark indefinitely would not do, I gave the order to halt and started for the lake, picking my way over mud. On reaching the edge I tasted the water and found it as salt as the sea. We next tried digging, and got a little water which, though slightly fresher than the lake, was still of no use as a thirst quencher. There was nothing to do but to go to bed thirsty and trust that water would be found next day. Towards morning we were awoke by a hailstorm beating on our tents. A kettle was at once filled with the hailstones, and before long we were enjoying a cup of tea. Feeling thoroughly refreshed, we loaded up and continued our journey. Before going 5 miles we found a large spring of fresh water discharging an enormous volume into the lake; the poor animals who, alas, had received little benefit from the hailstones, simply rushed into it, and stood there drinking their fill.

While we were pitching camp, a black spot was made out on a distant hill-side. On bringing a glass to bear on it we found it to be a nomad's tent, round which some sheep were grazing. I at once sent over two men to procure guides if possible, and generally to make inquiries as to the route, etc. They returned, saying that there were no men at the tents, but only five women, who said that in five days we should reach the headquarters of the Khamba people, and that tents were to be met with all the way.

Next day we moved our tents over the river and pitched them close to the nomads. As we approached two men, who evidently had been hiding when my men had gone over, advanced to meet us. They were dressed in sheepskin robes, on their feet they had bright-coloured woollen stockings coming up to the knee and soled with yak's hide; their hair was in matted locks hanging down on each side of the face. Slung over their shoulders were long matchlocks with two-pronged rests on the end, and in their belts, stuck diagonally across the front of the body, they had straight swords in scabbards, ornamented with silver incrustations and turquoises; in their hands were long spears. These men were very anxious to know who we were and where we were going. I told them we were merchants and had lost our way in the mountains. They said that in a south-easterly direction lay Khamba, which was thickly inhabited by nomads; but they dared not take us there, as if they did they would assuredly have their throats cut for bringing strangers into the country, and the people would be sure to oppose us. In reply to my inquiries as to a road running east, they denied the existence of such a road; but they offered for 40 rupees to guide us in a southerly direction to a place called Sakhi, on the Leh-Lhasa road. Though this did not suit my plans at all, I pretended to fall in with the idea, and said, "All right; but it is a pity you cannot show us a road running east, in which case I would have given you more than double the amount." They then retired, but reappeared in about an hour, stating that after consultation amongst themselves they had discovered that there was a road running east, and were prepared to make a bargain to guide us for ten days along it. They were quite effusive in their friendliness, assuring us that they had deceived us at first under the impression that we were the advanced guard of an army; but now they had discovered their mistake and meant to be honest and above-board. A bargain was concluded with them, and under their guidance we resumed our march in an easterly direction. In three days we found ourselves on the banks of Lake Aru Cho, a noble sheet of water lying at an elevation of 17,150 feet. In every direction wild yak and antelope in incredible numbers were to be seen; but no trees and no signs of man. This peaceful-looking lake, never before seen by European eye, seems given over as a happy grazing-ground to wild animals—a veritable sportsman's paradise.

For one march we travelled north along the western edge, then turning east, leaving the lake behind, crossed a ridge and descended to a pool of water where we camped. During the night our new guides managed to desert. To attempt to follow them was out of the question, so there was nothing to do but endeavour to make the best of our way by ourselves. The great anxiety now preying on my mind was the uncertainty of finding water, as we had no one who knew the country. However, luck seemed to favour us in the most wonderful way, and day after day, when we were beginning to despair of finding any, we suddenly came on a spring or a pool of fresh water.

Another constant difficulty was the straying of the ponies. They had to be turned loose at night to graze or they never would have been able to march next day. Often when we got up in the morning one or two were missing, and search parties had to be sent out to seek for them. On one occasion six donkeys and eighteen ponies disappeared in the night leaving us perfectly stranded. We had to halt for four days scouring the country all round before they were recovered, and until they were found I much dreaded that nomads had stolen them.

Thus we journeyed for some weeks. The country was all of the same character—rounded, undulating hills with wide open valleys, and here and there sharply-defined snowy ranges. Game consisting of wild yak, kiang, Tibetan antelope, and gazelle, was exceedingly plentiful, and almost always in sight. But no signs of man were visible. At last on August 22nd the tracks of a party of nomads were seen. I sent two men to follow up the tracks and endeavour to obtain guides and supplies. The nomads received them with levelled matchlocks; but their hostility was overcome, and a bargain was nearly concluded when some other nomads suddenly appeared and opened fire on my men, the only result being that one bullet broke the leg of a Tibetan's pony. Though the nomads having fired off their matchlocks were quite at the mercy of my men who had breechloaders, these did not return the fire, as I had given them strict orders not to fire unless absolutely obliged to.

The character of all these nomads is much the same—greedy, faithless, and suspicious. Their suspicions do not attach only to foreigners; every camp seems to view every other camp as not only a possible but a very probable enemy.

After this provisions began to run out, and game unfortunately became scarcer, so all hands had to be put on reduced rations, and kiang, an animal something resembling a mule that we had formerly scorned, had to be shot for the pot.

Before many days were over more nomads were seen, and from them we managed to obtain some supplies; but they all viewed us with much suspicion. As we advanced the inhabitants of the tents came on with us, and before long we found ourselves escorted by about a hundred men

all armed with matchlock and sword. They endeavoured to induce us to halt, but I declined to do so until some responsible headman was met with. In this way we journeyed until August 31st, when we camped at a height of 15,621 feet. Early in the morning a poor mendicant Lama came over to our tents to ask for charity, and also probably to spy. He said that we had been wrongly informed as to the roads; the one to the south led to Tashi Lunpo (Shigatse), and to reach Lhasa it was necessary to go through a depression in the hills to the east. As this was more in accordance with my own observations, I came to the conclusion that he was telling the truth, and so we started off in that direction. The valley was studded with black tents, and herds of sheep and tame yak were grazing in every direction. Goa and kiang were also to be seen; but the former were very wild, the latter were in troops, and decidedly inquisitive. On reaching the head of the valley, we followed the bed of a rivulet fed by springs, which took us on to some high plateau-like ground, where we met once more our old friends, the Tibetan antelope: we had not seen any for some days, and it is evident that they do not often descend below 15,000 feet, and are decidedly scarce below 16,000 or 17,000 feet. In the night heavy rain fell, coming from the west.

On leaving camp next day we went through a narrow defile that opened out on a wide valley in which was an enormous lake. As we were approaching it, three mounted men caught us up; one of them appeared to be a sort of headman. He wanted to know all about us, and was not the least satisfied on being shown the Chinese passport, as he said that the year before, two Russians (by whom I presume he meant the two French travellers, M. Bonvalot, and Prince Henry of Orleans) had come into the country, also provided with a Chinese passport; that immediately afterwards information had come from China that a passport had inadvertently been issued, but that no notice was to be taken of it, and all Europeans were to be rigidly excluded. He then wanted us to halt while he communicated with some of his superiors. That I refused to do, and, at the same time, told him that our only reason for taking the Lhasa road was the necessity for obtaining provisions, our real intention being to go more to the north, and if he would supply everything wanted, we would continue travelling east and would pass to the north of Lhasa. However, he would not agree to this, and said he had heard from Lhasa that an English invasion of Tibet by the Chang was expected, and he suspected our party of being the advance guard. Near our camp there were three upright stones resembling those on Salisbury plain, and close to them were the foundations of several rectangular stone houses. I was much astonished at seeing them, as the highest flights in the architectural line that we had seen up to date were some old sheep pens; these had evidently been something of a very different class. In the evening more Tibetans arrived, and having

pitched their camp a little distance off, came over to try and induce us to halt, but being unsuccessful in their endeavours, departed.

Next day, soon after leaving the last camp, we found ourselves on the banks of a large stream flowing into the lake. Although it was cut up into many branches, it took us some time to find a ford, and then we only got over with difficulty; all our bedding and baggage got wet. Another stream, further on, though it did not hold nearly as much water, was almost as difficult to cross, owing to the stony nature of the bottom, and force of the current. After crossing it, we turned up a valley on the south, and camped. While we were pitching tents, a number of men, all armed with sword and matchlock, came up, and going a little bit ahead of us, camped. They were followed by a lot more, who camped on the other side, thus hemming us in completely. I sent two men to ask what they wanted, and received an answer that this was their country, and they were moving about in it—an answer that it was impossible to take exception to.

After a night of very heavy rain we continued our way up the valley. The following morning, as we were preparing to start, a zoung, or official, turned up, accompanied by a lesser light. He went to the Dokpas' tent, and sent four men to ask us who we were, and what we wanted in the country. To this I answered that, if he wanted to know, he had better come over himself, as I was not going to be interrogated by menial servants. On receiving my message the great man, accompanied by the lesser light, and a dozen of unwashed hangers-on, came over to our camp. I took them into my tent, and seated them on yakdans, after which they rather abruptly opened the conversation by asking, "Who are you, and what do you want here?" In reply to which I said, "We are English; we have come from Ladakh, are going to China; and here is our passport. We don't want to go to Lhasa, and have only come south to obtain provisions. Give us provisions and a guide, and we will continue our journey east."

The answer to this was that if we attempted to proceed they would be obliged to oppose us, as if they did not not do so they would certainly lose their heads. If we fought and killed them, well it was just as good as being executed in Lhasa. They were absolutely immovable in this resolve, and I have not the slightest doubt would have attempted to stop our progress by force had we resolved to go on at all hazards. So I judged it better to come to some understanding with them, and after arguing over every trifling point and much circumlocution the following treaty was drawn up:—

(1) We were to be taken to a place three marches off in either an easterly or southerly direction, where water and grass were plentiful.

(2) Arrived there we would halt fifteen days, in order to allow matters to be settled in Lhasa, and allow any officials who might be sent to see us.

(3) During our halt we were to receive daily one sheep, 12 lbs. of flour, 12 lbs. of tsampa, and 1 lb. of butter; these things were to be supplied at a rate which they said was under market rates.

(4) The safety of ourselves and our property was guaranteed, and the value of anything stolen was to be paid to us.

After the treaty was drawn up, before they left I gave them each a small present, and hinted at the possibility of other and more valuable ones being forthcoming in the event of things being satisfactorily arranged.

They were both men of a very superior type to the wandering Dokpas: intellectually and physically they were fine men, and about both there was an air of pronounced individuality. As regards their dress, they wore the same kind of dingy red woollen garments ordinarily worn by Lamas; across the shoulder they had belts, on which were strung miniature shrines, about 7 inches by 4, containing prayers, etc. Their hair was in pigtails, much ornamented with turquoises, etc., and brushed well back from the head; quite a different style to the Dokpa fashion, where the pigtail is only an adjunct to a very rugged shock-like mass of hair, innocent of brush, comb, soap, or water. They made light of Chinese influence in Tibet, saying the only ruler in Tibet was the Deva Zhung (Central Government of Lhasa; the term is also sometimes applied to the Talai Lama). In the evening very heavy rain fell, and as no dry yak dung was to be found, we had great difficulty about cooking anything, and were reduced to burning the ridge-pole of a tent.

On September 5th our friends, the Tibetan dignitaries, were not ready to start with us, evidently indulging in that luxury, known in India as a Europe morning; but a small boy was sent to show us the way towards the place we had agreed to halt at. Marching in the same direction as ourselves was an enormous caravan, consisting of about four hundred yaks, fifty horses, and several thousand sheep. In reply to our inquiries they said they were a party of merchants, Chinese subjects, that their home was one month and a half distant, and that having brought goods into the country, they had exchanged them for live-stock which they were now taking back. However, some of the Tibetan officials' followers who had caught us up told a different story, saying that they were Chukpas (brigands), and that all the animals were the produce of industry in other paths than those of commerce, and the further apart we camped the better. So acting on this advice, after the sheep in wolves' clothing halted, we continued our march for another 8 miles, and camped on the banks of a stream flowing into a large lake. Numbers of nomads' black tents were to be seen in every direction.

Next day, a few miles after leaving camp forty-nine, we crossed a narrow neck of land between two lakes, the northern one of immense

size, while the southern one was of extremely irregular shape, having branches running up valleys in every direction, and islands, some of them fairly large, scattered about its surface. It was of singular beauty; and to the south a high cone-shaped peak, capped with snow, threw its shadow across; but what made the great difference that exists between it and other Tibetan lakes was the freshness of the water. Grass grows right down to the edge, and the invariable adjuncts of fresh-water gulls, and terns, wheeling about uttering cries, gave a feeling of life and animation contrasting strongly with the death-like solitude hanging over the salt lakes. It is almost impossible to get the correct names of places or lakes in Tibet, as every Tibetan lies on every occasion on which he does not see a good valid reason for telling the truth. Sometimes I have asked half-a-dozen men separately the name of a lake and received half-a-dozen different answers. The names I have put on my map are those in favour of which slightly more evidence was forthcoming than for others; but still some of them, including those of these lakes, may turn out to be erroneous, when further explorations have made us better acquainted with the country.

After leaving our last camp we crossed a narrow neck of land about the size of, and somewhat resembling, a railway embankment, with a lake on each side. A Tibetan, in the course of conversation with one of the caravan drivers, stated that the large lake on the north of which we were continually getting glimpses and occasionally extended views, was called Tengri Nor by Mongols and Tengri Cho by Tibetans; but I fear he lied. However, whatever the right name might be, there was no doubt of its being a noble sheet of water, stretching out east and west to an enormous distance; it seemed more worthy to be called an inland sea than a lake. But like all the Tibetan lakes, it showed signs of once having been larger than it is now; some of the lakes appear to have dwindled to about half their original size. Between it and our camp were some large lagoons of fresh water fed by streams coming down from the hills.

The escort seemed to grow in size every hour. Parties pouring out from all the side valleys fell in and came on with us. Though possibly they were not all intended to form a guard of honour, I thought it best to regard them as such, and hugged myself over the idea that we were being treated as distinguished guests. They were a quaint-looking lot, with long rifles terminating in a prong-like rest, to one arm of which was attached a red flag. Straight swords in scabbards encrusted with silver and studded with turquoises, stuck crossways in the front of their belts, prayer wheel in hand, dirty sheepskin raiment, hats that must have been introduced by a designer of garments for a burlesque, shock heads, pigtails, short stirrups and miniature steeds, all made up a picture, that though longing to photograph, I judged it wise not to for fear of exciting their suspicions.

From our camp a road ran southward to Lhasa, and people were continually passing backwards and forwards; one party said they were going to meet the dignitary of high rank that was expected out to interview us. As my passport was for Chinese Turkistan and mountains to south and west, I anticipated that when read, we should be allowed to take the way to the north and no other. The Tibetans sent over more supplies, consisting of a cake of brick tea, two pounds of butter and two sacks of nice dry cow-dung, but no flour or suttoo, those things not having arrived. However, they came next day, and brought a cake of a sort of Tibetan cheese; as Nebuchadnezzar said of the grass: "It may be wholesome, but it is not good." A plenipotentiary that I sent over to the Zoung's camp to fetch fuel, reported on returning that the old man had hinted that when permission came from Lhasa to proceed, he expected a trifling douceur in return for his trouble in providing a guide. So, rejoicing to find that he was civilised enough to understand the nature of a douceur, I sent a message that he need not fear on that score; as my knowledge of Tibetans increased my delicacy about suggesting gratuities decreased in beautiful arithmetical proportion. In order to try and find out the real name of the big lake, I instructed a caravan driver to get into conversation with the passers-by on the road and find out from them. The whole of Tibet could not have been instructed to give false answers, so barring the natural tendency of the people, there was nothing to prevent the real name being got at; but that natural tendency struck me as a pretty difficult obstacle when he returned, having interviewed several parties and got different names from each.

The Zoung paid us a state visit in the evening, and was very pressing in his inquiries as to where we had first met inhabitants. Evidently the arrival of Europeans had not been as quickly reported as it should have been, and he wanted to punish the delinquents; but, as we were dressed in Ladakh raiment, and the people always prefer to look at strangers from afar off, our not being spotted as Europeans was hardly to be wondered at. Next day, when we were starting off to pay a return visit to our friends, a messenger came over from their camp, asking us to postpone it, as they were very busy owing to important news having arrived. We were naturally curious as to what had happened, and the messenger showed no unwillingness to be communicative. It appeared that the Chukpas, whom we had passed on the road, not content with the enormous numbers of animals they had collected, had made another raid, and after killing several men had driven off two hundred yaks, fifty horses, and an enormous number of sheep. Such goings on close to Lhasa were unheard-of and occasioned great excitement. Meanwhile the Zoung was busy organising parties in order to endeavour to recover the stolen property. I suggested that as the Chukpas' herds were close by, the best plan would be to seize them; but it appeared that they had been

lifted in Kangri, a country away to the east, and as the Deva Zhung received a tax on each head driven through the Lhasa country, they were regarded as inviolable. However, as the Chukpas on their part undertook not to raid in the country near Lhasa and had broken their bond, I should have thought the Lhasa people would have been justified in breaking theirs also; but the Zoung looked at it differently. His idea was that the Chukpas having committed a breach of good manners, was no reason for his also doing so; but at the same time he would not hesitate to execute them if he got a chance. A Lama came to visit us, and was very strong in information regarding the names of places and other geographical facts; but the names and the facts differed very considerably from those given by other people. On the whole I was inclined to think him fairly truthful. He called the big lake in front Garing Cho, the district we were in Naksung Sittok; and to the east lay Doba, Numru Sera, and Nakchu. In the latter Shiabden Gomba is situated; from there two roads run towards China, one on the north to Sining, or as he called it, Gya Zilling, and a more southerly one of which he knew nothing. Chukpas abounded on the Sining road, and the general custom was for travellers to wait at Shiabden Gomba until several hundreds could be collected, and then cross the dangerous zone together for mutual protection. From Namru, a road runs to Lhasa, by which it would be possible to go straight into the sacred city without meeting a soul; but for us the Zoung and his small army put that out of the range of practical politics. Our arrival had created tremendous excitement. First of all, rumours spread that an English army was coming, next that it was only a party of Chinese travellers; and lastly, the true one, that we were English, but our objects were peaceful.

On September 27th the Kushok of Naksung, the expected colleague, turned up, and sent a man to call me over to his tent. I replied that if he wanted to see me he had better come to my tent. As I had waited twenty-one days for him, it was the least he could do. He came over, as I knew he would, the message having been simply an attempt to see if I could be bullied. Like all high dignitaries, he rode a mule, and held a bright red umbrella over his head. The latter much puzzled my orderly, who could not make out whether it was to keep off the sun or the rain, there being no signs of either at the time. The other Lhasa swell and our two old friends also came with him. My tent was prepared for their reception by neatly-arrayed yakdans, covered with scarlet blankets, to serve as seats. As soon as all hands were seated, business was promptly opened by the question, "Who are you, and where do you come from?" To which I replied, "We are English travellers; we had intended to pass more to the north, but, having run short of provisions, had steered towards the south, confident that, owing to the friendship existing between the British and Lhasa

Governments, we would receive every assistance." The answer to this was, that Tibet was forbidden ground to all strangers; that the only thing they would permit us to do was to return the way we had come at once; and as for the friendship existing between the two Governments, that was no reason why the people of both nations should not stick to their own countries. I then told them that it was of no use talking if they were going to introduce the subject of returning the way we had come.

Next day they came back again, and invited us to dinner the following day, an invitation which we accepted with much pleasure. On arriving at their camp, we were ushered in, and, after being seated on raised carpets, tea was produced. They drank it in Tibetan fashion, mixed with salt and butter; but, having found out from our servants the European fashion, they gave us some plain. After a considerable consumption of tea, bowls of mutton, boiled with rice and onions, were brought in. It was really excellent; but eating rice with chopsticks is an art that requires practice. The lower end of the tent was full of the denizens of the neighbouring ones, who walked in and out as if they were members of the great man's family. The whole scene had a very patriarchal air about it; and I was much struck with the respect shown by the common people to their superiors, continually bowing and sticking out their tongues when spoken to, that being the Tibetan mode of salutation. Before dining, and after the repast, the conversation turned upon the road we were to take. They maintained that if they allowed us to advance they would be executed on returning to Lhasa, while I stuck to my former statement that I would not go back a yard. Before leaving I invited them to dine next day with us. They agreed, and we made our exit amidst much bowing. They were pleasant, intelligent men, but exceedingly obstinate. When I pulled the Chinese passport out of my pocket, and asked them what was the meaning of the Amban's presence at Lhasa, if that was not to be read or to come into the discussion. They replied that the Amban was allowed to live at Lhasa as a visible sign of the friendship existing between the two countries; but Tibet was in no way under China. At the same time they produced a letter that had been sent after them from Lhasa, in which they were instructed to take no notice of any Chinese passport, but send us back the way we had come.

Other visits were exchanged. They asked many questions about England, and were much surprised to hear that it was surrounded by water, and that people went to it in ships. They had not the faintest idea what a ship was, and asked if it went through the water touching the bottom the whole way. Like true nomads they were particularly curious also about the water and grass.

Eventually they agreed to the following bargain:

We were to go back eight marches, and then travel east by a more northerly route. The Kushok was to accompany us for twelve marches, and after that we would be guided by four men, whom he would supply. We were to receive twenty ponies, 2160 lbs. tsamba, thirty sheep, 60 lbs. butter, 1100 lbs. barley, nine pairs pubboos (Tibetan boots). In return for all these I agreed to hand over 800 rupees.

As soon as the treaty was concluded, men were sent off in every direction to collect the supplies, and the headman of Shildut, who had been our original jailer, returned to his home. He was a nice old man, and I felt quite sorry at his departure. The rest of our time at Gaga Linchin was principally taken up taking over stores and transport animals. The ponies were sturdy beasts, about 12–2 hands, but were all a trifle long in the tooth; however, "never look a gift horse in the mouth," and if they lasted for three months, that was all we wanted. The Kushok rather astonished me one day by expressing admiration of our beards, and asking if we had any medicine that would make his grow. As anything like a decent beard is almost unknown in Tibet I should have thought a hairless face would have been more admired. The Lama was very anxious to know if we had any English poisons. Poisoning is very prevalent in Tibet. If one offers a man tea, he generally refuses it, unless someone first drinks a portion in his presence; and when offering anything to eat or drink a Tibetan invariably ostentatiously takes some in order to show there is nothing to be afraid of. We were also asked if gold, pearls, and rubies found a place in the European pharmacopœia, and much surprise was expressed when Dr. Thorold assured them that they had no medicinal value. The Talai Lama is regularly dosed with medicines composed of those ingredients, so there is little to marvel at in Talai Lamas all dying young.

The tales Tibetans tell and I really think believe are sometimes most marvellous. We were told of a country not far off where men lived, who possessed only one arm and one leg, but no one would allow that he had seen any of these interesting people, and they would not even say in which direction the country lay, or how far off it was. Another wonderful country was one on the road to China, where the people had pigs' heads, but as with the other tale no one present had ever been there or seen the inhabitants thereof, though nearly everybody knew some one that had. Another story we were told was about a lake away to the north called Tso Ngom Mo, or the blue lake,—so large that it took thirty-five days to ride round. Formerly no lake existed, but some Chungpas lifted up a large flat stone and water immediately gushing out overran the country. An animal is found in the lake and nowhere else whose skin is of fabulous value. Once a year one has to be sent to the Emperor of China. Should it be omitted by any chance, several dignitaries would lose their heads, but no one seemed very clear about who were the dignitaries who were to be thus summarily punished for

neglect of duty towards the Sun of Heaven. I fancy the lake meant must have been Koko Nor, but it is terribly hard work trying to get geographical information out of Tibetans, for when, as in exceptional cases, it does occasionally happen, a vein of truth runs through their statements, it is so fine as to be almost impossible to discover.

Everything having been arranged, on October 4th we started to retrace our steps, and on the 12th, leaving our old route, we struck north.

On October 18th we managed to get over a snowy range that had been staring us in the face for several days. The pass was 18,768 feet high. There was not much snow on it, but the wind was bitterly cold, and no one took sufficient interest in scenery to linger on the top. After descending, the Tibetan yak-drivers wanted to halt at a place where there was very little grass and no water, but I insisted on their coming on until we got to water. A few miles further on we found a spring and camped. I then let them all go with a small gratuity, which much astonished and delighted them, the Tibetan custom being to requisition transport and pay nothing. We were now dependent on our own animals for carriage, the tow-rope being fairly cut and an uninhabited country in front. I sincerely hoped there were not going to be many high passes to be crossed, as nothing takes it out of horseflesh so much as struggling over high passes under heavy loads. Our old friends, the Tibetan antelope were once more to be seen. From the good service they had done us, in the commissariat line, I looked on them with respect.

It would take too long to tell of all the vicissitudes of our daily marches before once more we met inhabitants. The guides turned out to be quite ignorant of any road, and were only anxious to take us as far away from Lhasa as possible. Water was almost unprocurable, as what fresh water there was in the country in summer, was now all frozen, and fuel was not procurable in sufficient quantities to thaw it. The cold got daily more and more intense, the thermometer going down to 15° below zero with a wind that made us spend the nights in continual dread that the tents would be carried down. Minus 15° may not appear to be startlingly cold to those who have been in Canada, but with a temperature like that, the effect turns upon wind or no wind, and on the Chang a wind is almost always blowing. Day by day our animals knocked up and had to be abandoned or shot. When at last inhabitants were met with we all felt that a very few more days without assistance would have exhausted our marching powers.

On November 14th we met with nomads once more, and on that day for the first time for five months we camped below 15,000 feet, an occasion which, as water was abundant, I celebrated by washing, an eccentricity on my part that absolutely horrified the camp followers. It was a ceremony that, owing to the scarcity of water, we had only been able to perform at irregular intervals. From that time on we were always

able to obtain transport from the inhabitants from stage to stage, and one great anxiety was removed. As we proceeded eastwards we began to get among a more disagreeable people. Part of our route lay in Chinese territory, part in territory under Lhasa, and in some places the inhabitants owned allegiance to neither. Thieves abounded, and it was difficult to avoid getting into a row. In one place a man drew a sword on Dr. Thorold, and in another thirty men were discovered at night lying hid close to the camp, evidently intending to rush it as soon as they were certain we were all asleep. It is needless to say that we did not give them an opportunity of doing so. However, beyond losing some packages which were stolen, we reached the neighbourhood of Chiamdo without having had any trouble. During all the expedition, from start to finish, we never—though sorely tempted on several occasions—used violence to the natives.

On approaching Chiamdo we were met by a church dignitary, evidently of very high rank, arrayed in red garments, ornamented with gold embroidery and with a yellow cap on his head. On getting near he dismounted, and presenting a scarf of welcome said that the Amban had sent him with a request that we would be good enough to halt for a little at a house close by. I agreed to this and he galloped back whence he had come. We proceeded more leisurely, and on arrival at some barn-like buildings close to a bridge dismounted, and were ushered in, numbers of Lamas crowding round us. We were kept waiting there a few minutes, and were getting very impatient at the delay, when the Amban appeared. He was an extremely girlish-looking youth in appearance, manners, voice, and everything about him truly feminine: his mincing gait as he advanced, holding out his hand in a most extraordinary but no doubt very fashionable manner, quite took me aback. As soon as we were all seated, he asked whence we had come and where we were going. After being told he suddenly rose up and went out leaving us with the Lamas, a much more stiff-necked and difficult lot to deal with. They were a strikingly able and intellectual looking set of men; the two head ones especially had faces that would arrest attention anywhere. Education and the habit of ruling had no doubt done a good deal to mark men gifted by nature with talents above the ordinary run of their fellow-countrymen. They plunged at once into business and said, come what may they would not allow us to proceed along the road to China passing through Chiamdo, but they would give us every assistance if we would go by the route passing to the north which had been followed by M. Bonvalot and his companions. I told them I was determined to go straight on, and would not turn to the north for any one; as for Chiamdo, that it happened to be in the way was unfortunate, as I did not care a bit about seeing it, and if they liked I would promise not to enter any monastery; but we were going to China: this was the straight road, and I would go by it, and no other. They would not

agree to this at all and began tharetening, saying: "Advance, if you dare; we have three thousand men with guns and will soon stop you." I said, "All right; if you want fighting, you will get it; but straight forward we are going." Voices were being raised; both parties getting very angry, and it looked as if the fighting was going to begin then and there, when the Amban entered and peace was restored; he got the Lamas to leave the room, promising to settle the question with us. He was very easy to deal with, and inclined to agree to anything, but was terribly afraid of the Lamas; it was very evident that his authority was only a mere shadow. The arrangement come to with him was that we were not to enter the town, but to skirt it, rejoining the road on the further side. Soon after he had taken his departure he sent a man over saying he would like to have a talk with us quietly when no one was about, and would we receive him some time after dark. I sent back a message saying we would be delighted to see him at any time that he cared to come. About 9 P.M. he came over, and after we had seated him and given him tea, the conversation began. He assumed an extremely confidential tone, and said he would like to do everything in his power for us: that the English and Chinese were like brothers, and great friendship existed between their respective Governments, but the Lamas were a very turbulent set, and he really had no power at all, otherwise he would have taken us into Chiamdo and shown all the hospitality that was in his power. He trusted that we would realise the position he was placed in, and pardon his apparent want of friendliness. I told him that it was quite apparent what sort of people he had to deal with, and we quite understood the position he was placed in.

A few miles after passing Chiamdo we came to a village and halted, the Chinese Mandarin and about a couple of dozen monks escorting us. I determined to halt there for a day, but the monks objected strongly and once more began talking about the three thousand men with guns that they had, and threatened to bring them if we were not out of the place by daybreak. But it was only an attempt to intimidate us. We halted for the day and saw nothing of the three thousand musketeers, whose existence I began to consider rather problematical. But before we left, these extremely warlike monks who had been threatening us steadily, all appeared, and making humble obeisance sued for remuneration for the assistance given. What assistance they had given I failed to perceive, but as it is of vital importance in Tibet to conciliate the priesthood, I gave them some money and we parted the best of friends.

From Chiamdo to Batang the travelling was not very difficult, but the people in one or two places were exceedingly good hands at pilfering; any small unconsidered trifle left lying about for a minute disappeared. In this country Buddhism seems much more strongly impregnated with Hinduism than further east. On the stones composing manes

figures of Hindu gods are often seen, and in one house I saw a brass image of Ganesha. At the same place, on our arrival, the headman of the village meeting us inquired of the caravanbashi of what religion we were, and was told Buddhists. The headman hearing this said that he was very much pleased, as the only comfortable place for us to put up in was the idol house, but that their idol was very touchy, and if any one other than a Buddhist was to enter his house he would punish all the inhabitants of the valley. Though this idea of our being Buddhists had not been spread under my sanction, I determined more fully to utilise it by taking observations for position under the cloak of Buddhist ritual. Endeavours to take observations by stealth had previously failed, as had been evinced by stones landing round me during the operation. Now new tactics were adopted. The caravan drivers, all Mohammedans but thoroughly conversant with the details of the Buddhist religion, were mustered on the roof of the house, and put to chant the proper formula, while at intervals a bell was rung and a fire stirred up. Covered by these observances I manipulated, with the assistance of Atma Ram, the sub-surveyor, a theodolite and bulls-eye lantern, and thus managed to fix the position; while an odour of sanctity was spread round me that lasted for some time.

Between Achowa and Asi is a stretch of country much frequented by chukpas, the brigands of Tibet; there they lie in wait for caravans. We saw nothing of them, however, and they are very different men to what I take them to be if they would attack by daylight a caravan known to contain breechloaders. Many of the people from these parts fought against us in Sikhim, and have returned to their homes spreading tales of the marvellous effects of English rifles.

From Batang to Ta Chen Lu the road had previously been explored, and I have nothing new to add to what other travellers have written. What astonished me most was the enormous amount of tea met with on the road being taken to Lhasa, and the cheap price of gold at Litang, fourteen to one being the relative value of silver and gold.

At Ta Chen Lu, where there are three French Catholic missionaries, we entered China; meeting with Europeans once more was a great pleasure. I cannot say how much I am indebted to the missionaries for all the assistance they so kindly rendered in making arrangements for our onward journey; and whatever our religious views may be, no one can refuse a tribute of admiration to gentlemen of education who voluntarily exile themselves to a pestilential spot like Ta Chen Lu, in what they consider the performance of their duty.

From Ta Chen Lu we went to Ya Tu, on a branch of the Min River; thence by raft, boat, and steamer to Shanghai, which was reached on March 29th; then on to Calcutta and back to Simla, after an absence of twelve months and a half.

The caravan drivers returned to their homes in Ladakh *viâ* Pindi;

parting with them was a painful business, and I shall ever think kindly of the men to whom I owe so much, and to whose steady, uncomplaining hard work the success of the expedition was principally due.

I shall conclude by a rapid glance at the general geography of Tibet.

The population of Tibet proper, *i.e.*, the country under the rule of the Deva Zhung, may be estimated at four millions. Chinese Tibet, including the province of Amdo, together with Kham, which is really governed by its own chiefs, and owns only a nominal allegiance to Lhasa, may be taken as holding another four millions, thus giving a total of eight million Tibetans, half in Tibet proper, and half outside it, of whom, probably, nearly half a million are monks. When one regards the size of the country in which these eight million people are contained, it is evident that it is very sparsely populated.

There are several reasons for this: the first is the custom of polyandry, which is largely, though not universally practised; the second is the large number of monks, who, though probably only nominally celibate, are forbidden to marry; and thirdly, although the country, especially in the East, could support a larger population than it does at present, still the greater part is only capable of supporting wild yak and antelope.

The whole of Central and Northern Tibet, and almost the whole of Western Tibet is known as the Chang. It consists of a high tableland with hills, mostly of a rounded character; but here and there sharply defined snowy ranges are met with. The mountains have a general east and west tendency, but no defined watershed exists; rivers may be met flowing in almost any direction, and all terminate in large salt lakes. These lakes appear to have been at one time much larger than they now are, as unmistakable signs that they are drying up are to be seen An idea of the physical configuration of the country may be gathered from the fact that for five months we never once camped at a lower altitude than the summit of Mount Blanc; and all the enormous stretch of country we covered in that time contained not a single tree. The greater part of this Chang is, of course, uninhabitable for the greater part of the year, and most of the places that would afford grazing in summer are too far distant from suitable winter quarters to be availed of by the nomads. But round the edges a few are to be met with, living almost entirely on meat and dairy produce. Very rarely do they get anything in the way of flour, a very little "Tsampa" being the only starchy food their tents ever boast, and that is regarded as a luxury to be partaken of sparingly.

In South-eastern Tibet the country is of quite a different character; deeply-cut valleys, steep, well-wooded hills, and rivers that eventually find their way to the sea being the characteristics. The population is a settled one, living in houses and growing crops, but in character there is little difference between them and the nomads—faithless, immoral, cowardly, and untruthful; to those they are afraid of they are servile,

but to those they are not afraid of insolent. Their faithlessness and unreliability has often been shown in the way they have deserted the French missionaries, to whom they owed so much, whenever there was any sign of a disturbance. Their physique is distinctly good, and they appear to be able to stand almost any amount of cold and hunger; less industrious and skilful than the Chinese, they are still an active, lively people, and at first one is inclined to regard them as simple and light-hearted, but they are only simple as compared to their neighbours, the Chinese.

The dress of the common people consists generally of a long sheepskin robe very dirty and greasy; this is hitched up by a waist-belt during the day so that the upper part is very full, and the lower part hangs down like a kilt. At night they take off the belt and allow the robe to come down to their feet; it thus serves the double purpose of clothes by day and bedding by night. In warm weather, or what they consider warm weather, the right arm is bare, being thrust out of the coat; in the front of the waist-belt thrust across the body, a straight sword, in a scabbard ornamented with silver and inlaid with turquoises, is carried. On their feet they have boots, made of brightly-striped woollen cloth, coming up to the knee and kept there by garters. The love of ornaments and jewellery is a very marked trait in their character, and the amount of the precious metals used up in the country in that way must be very great. The richer people affect red woollen cloth and various-coloured silks.

As the Chinese in the country take unto themselves wives of the country, there must be a certain admixture of races, particularly on the main route to Lhasa, where there are a few Chinese stationed at each of the rest-houses; but the children seem to grow up thoroughly Tibetan, and travelling through the country one does not see any people having the aspect of half-breeds, though on inquiry people who are the result of these mixed marriages are pointed out. The fact that the Tibetans do not allow Chinese women to come into the country is of itself enough to show how shadowy are any claims the Chinese may have to the supreme sovereignty. I do not suppose anyone will advance the theory that the order issues from the Pekin Government.

The rainfall and snowfall are fairly heavy, and during the short summer crisp grass springs up, exceedingly nourishing, as is often the case with grass growing upon a soil covered during a considerable portion of the year by snow. This grass maintains large numbers of yak, Tibetan antelope, and kiang, though it is difficult to conceive on what they subsist during the long winter months. Bird life is poorly represented, and the only game birds that appeared to breed there are the Tibetan sand-grouse and bar-headed goose; though in Eastern Tibet pheasants and partridges are numerous. Insects are scarce, a few butterflies and some bees of a sort that live underground being

about the only representatives of the tribe that we met with. A few of the butterflies were met with at an altitude of 17,600 feet, and it seems marvellous how anything so fragile could live on those bleak, wind-swept plateaux.

Of flowering plants one hundred and fifteen species were collected. One was found at an altitude of 19,000 feet, probably the highest altitude at which any flowering plant was collected. These one hundred and fifteen species contain twenty-eight natural orders, an unusual number, I believe, for such a small collection.

Round the edge of this great plateau a few nomads from the neighbouring lower country graze their herds in summer; but the interior is never visited except by occasional wandering bands of brigands who find it a convenient place whence to issue forth and surprise the nomads, and to retire to if pursued by the Lhasa authorities.

Towards the east after descending from the Chang a country of quite a different character is entered. The rounded, undulating bare hills give place to steep, well-wooded mountains; and in the deeply-cut valley rapidly-flowing rivers, with a general tendency in the same direction, and not in salt lakes, eventually find their way to the sea, while yak, antelope and bar-headed geese are succeeded by stags, pheasants and partridges. The country bears a great resemblance to many parts of Kashmir, and in beauty is at least equal.

Before the reading of the paper, General R. Strachey, who occupied the chair, spoke as follows:—This being a special meeting, there is no ordinary business to transact. Captain Bower will now give you an account of his very adventurous journey across Tibet. He may be said to have commenced his apprenticeship to travelling in these extremely difficult countries in what I believe was a chase after the murderer of Mr. Dalgleish, who was associated with Mr. Carey, one of the Gold Medallists of this Society. The country through which this journey was made is Tibet, a huge mountain mass covering an area as large—if not larger—than the continent of Europe, excluding Russia, and the length of Captain Bower's journey from the point of departure to its termination in China, is about 3000 miles. The journey, I need hardly say, was not like walking down Piccadilly; for at least half of the distance he was never below 14,000–15,000 feet. Very often it was above 15,000–16,000 feet, with the occasional diversion of passing a range of mountains larger than the Alps—larger a good deal than the Caucasus—a very large portion of the country being without inhabitants or vegetation, the most dreary and dismal country—so far as natural productions are concerned—that is to be found in the world, short of absolute sandy desert. I, probably, beside Captain Bower, am the only person here who has been into Tibet proper; but my experience was obtained upwards of forty years ago.

After the reading of the Paper, the following discussion took place:—

Mr. H. Seebohm: Captain Bower has spoken very briefly and somewhat slightingly of the birds which he found on this great journey. You will be interested in hearing that the small collection, entirely consisting of game birds—for they had not cartridges enough to allow them to shoot anything which they did not think fit to eat—is perhaps the most interesting collection which has ever been obtained, if we

except the collections of game birds which have been obtained on the various journeys of Colonel Prjevalsky in the northern part of Tibet. They consist of only seven species, but all of extreme rarity. We have first Bonvalot's Eared Pheasant, a very handsome bird, with a great deal of white upon the tail, which has only once been previously obtained, and that but quite recently, by M. Bonvalot and Prince Henri of Orleans, almost in the same locality. The second is L'Abbé David's Eared Pheasant, which was only known for a great many years from the solitary example in the British Museum, of which the exact locality was not known, but which was afterwards obtained in considerable quantities at Moupin by L'Abbé David, the great French ornithologist. Another very interesting bird is a kind of Snow Partridge. Although it is not a true partridge, it is very nearly allied to them, forming a link between the snow partridge and the grouse. It was only previously known from two or three examples obtained by Count Szchenyi, the Austro-Hungarian traveller, who made an unsuccessful attempt some years ago to reach Lhasa from China. Then there is Dr. Anderson's Pheasant, an equally rare bird, discovered in Yunnan, the typical example of which is in the Calcutta Museum, the only other two specimens which are known to exist being sent alive to the Zoological Gardens in London from some part of Western China, the exact locality being unknown. There is also General Prjevalsky's Partridge, allied to an Himalayan species, and which was discovered by him on the Nan Shan Mountains, which, you are aware, lie to the east of the Kuen Lun; and Dabry's Blood Pheasant which was discovered at Moukin by the French Consul at Hankow; and, finally, three examples of the Tibetan sand grouse, not brought home by either Captain Bower or Dr. Thorold, but which they frequently saw upon the journey—a bird closely allied to the sand grouse, and which has made two great migrations to Europe within the last five and twenty years. The Tibetan Sand Grouse was discovered by Lord Gifford some years ago, who, you will remember, was the elder brother of one of the greatest Indian ornithologists, the late Lord Tweeddale. The collection, though extremely small, is of most unique interest.

General J. T. WALKER: It is scarcely necessary to remind an audience like this of the importance attached for many years past to our knowledge of the geography of Tibet, a region little known partly because of political difficulties raised by the Lamas in regard to any Europeans travelling through their country, but mainly because of the formidable nature of the country itself. It is enormously elevated, the plains reaching 18,000 feet above the sea-level, and mountains rising considerably above that. Tibet is most accessible from the south, the Himalayan regions; but all attempts on the part of Europeans to enter the country from that direction have failed owing to the opposition of the Lamas. All Europeans who have entered the country hitherto, until Captain Bower made the remarkable expedition of which he has given us an account this evening, have entered from the north. From the north Huc and Gabet entered and made their way down to Lhasa, the only Europeans with one exception who ever reached Lhasa, a century ago. Then the celebrated Russian traveller General Prjevalsky, two Englishmen Messrs. Carey and Dalgleish, two Frenchmen M. Bonvalot and Prince Henri of Orleans, and, later, the American traveller, Mr. Rockhill, all crossed that great belt of Tibet to the north, a belt of country stretching over 20° from east to west, with a breadth nowhere less than 100 miles, often much more, whose height is nowhere less than 14,000 feet, and which is entirely uninhabited, so that when travellers pass through it they have to take all the necessaries of life with them. Captain Bower entered Tibet from the west, on a line considerably north of that taken before by Pandit Nain Singh in his travels, and he has explored at least 800 miles of country never before touched by any European, or even by any of

the Asiatic explorers of the Indian Survey Department. His courage and enterprise have enabled him to perform a very successful journey, and I think we are all greatly to be congratulated on the result of his efforts.

Mr. DELMAR MORGAN: The paper we have listened to is one not only of great geographical interest but of great importance, because it shows what may be done by a European in the Trans-Himalayan country. It has been stated, and frequently reiterated, that access to these regions is impracticable owing to the obstinate exclusiveness of the natives or their rulers, and that if it is to be explored at all in the interests of science it must only be by trained native surveyors. I have always been of opinion, and have before remarked here, that these natives, however valuable some of their work may be, and however carefully trained in the use of instruments, cannot bring us that accurate information as to these countries which we require. They seem to lack that spirit of critical inquiry, and that fertility of resource, that distinguish the European traveller, and open to him as if by magic the most jealously guarded regions. Of the native surveyors, the only one to travel along a route parallel to Captain Bower's was Nain Singh in 1874–5, and since then there have been no attempts to open Tibet from the Indian side except by the Pandit A K, and to reduce the limits of that wide tract of unknown land marked as a blank on our maps between the 30° and 40° parallels. All the information we possess concerning it comes from foreign sources—from the Russian traveller, General Prjevalsky, from the Austrian Count Szchenyi, from the daring expedition of Prince Henri of Orleans, and M. Bonvalot, and lastly from Mr. Rockhill, whom we are to have the pleasure of hearing next Monday. All these travellers coming from the north succeeded in crossing the most difficult and dangerous parts only to be turned back when they reached the Lhasa governed district. The lesson that may be learned from their narratives is that there are no insuperable obstacles to entering these regions beyond the hardships and privations incident to travel in a very elevated region, and in a wild almost uninhabited country. The real difficulties begin when the traveller reaches a short distance from Lhasa, and Captain Bower's journey, resulting in a great access to our geographical knowledge, strengthens the conviction that the difficulties in the way of its exploration have been greatly exaggerated, and proceed not from the exclusiveness of the natives, nor from Chinese intrigues, but are rather due to the apathy and indifference at home. There seems to be a fear of diverging from beaten tracks and departure from established precedent. The earlier stages of Captain Bower's journey coincide very closely with those of Messrs. Carey and Dalgleish, but unlike those travellers who turned northward when they reached the Tibetan plateau, and descended to Keria, Captain Bower continued nearly due east and explored that long chain of lakes heard of by Nain Singh, but hitherto only roughly marked on our maps. He has brought us some very valuable geographical information and has also shown us what are the conditions under which travel may be successfully prosecuted in these regions; he has further confirmed the statements of General Prjevalsky and Mr. Rockhill that vast numbers of wild animals exist in these regions, a fact denied some years ago by so eminent an authority as our Chairman to-night. It is to be hoped that the Geographical Society will take to heart the lessons given us this evening, and, abandoning their indifference to the exploration of these regions north of the Himalayas, seriously take in hand the task of exploring and mapping the yet unexplored portion of North Tibet.

Note.—It is a remarkable fact that the last European to travel along the same route as that taken by Captain Bower was Père Desideri, of the Society of Jesus. His starting-point was also Leh, and he travelled to Lhasa in the company of a Tibetan princess. This was in 1715. No European has, to the best of my know-

ledge, attempted to follow in his footsteps till the other day, when Captain Bower and Dr. Thorold reached a point within a few marches of Lhasa.

Mr. D. FRESHFIELD: At this hour I can say but very few words, and I rise principally to express my regret at the absence of my predecessor in office, Mr. Markham, who has done so much to interest the public in the exploration of Tibet. I think we must all feel at times, however keen Africans we may be, that there is pleasure in a change of scene. To-night we have been transported from the plains and palm-groves of Africa to a country which is not a field of missionary enterprise, but which is instructing us in Theosophy, where we do not look down upon low forms of civilisation, but up to, perhaps, the most perfect form of home rule that exists on the face of the earth, to a country nominally owing allegiance to Pekin, but practically governed by the local priesthood. Ever since I read Charles Lamb's letter to his friend Manning, sympathising with him on being amongst "cold, insipid, smouchy Tartars," Tibet has had a peculiar interest for me. We all have to thank the Indian Government for having to a certain extent made a new departure in sending home an officer with leave to describe what he has seen, and also for having removed some of the obstacles to the publication of the descriptions given of Tibet by its native servants. One of them, Chandra Dass, has in a report now in print informed us, how not being under the same difficulties as Europeans, he penetrated into Lhasa and saw all its golden monasteries and temples, and took tea with the Grand Lama himself. I hope this work will soon be in your hands, and then you will be able to appreciate it.

This day week we are going to have another paper on Tibet—owing to the necessity of meeting travellers' conveniences we are obliged to put them close together—we are going to return to this country under peculiarly interesting circumstances, for the Council also have made a new departure, and have invited a most enterprising American traveller to come over to address you. Next week, therefore, we hope to have Mr. Rockhill, who invaded Tibet from the eastern side, and made two remarkable attempts to get to Lhasa or through to Darjiling, who will give us valuable information supplementing that given to us to-night. Under these circumstances before long we may be able to present a volume on Tibet to our Fellows, which will furnish a mass of information as to this remote, ancient and primitive region, which will not yield in interest even to the more romantic narratives of African travel.

General STRACHEY: It is not necessary for me to invite you to thank Captain Bower for the extremely interesting account of the remarkable journey he has made, through a country that is perhaps one of the most difficult in the world. I would say a few words as to the result of this journey from a geographical point of view, as it strikes me. From about long. 91° Eastern Tibet is traversed by a great network of rivers flowing eastward into the ocean; from about 80° the water flows in the opposite direction to the Indus. Between 80° and 90° there is a great area from which no water escapes to the sea, and through this region Captain Bower's journey has been made, and it gives us for the first time information from actual observation we have long wanted, and supplies what I may call a sample of Central Tibet, and shows that the old maps of the country, as obtained from the Chinese, are fundamentally correct. It is a great region covered with lakes with no flowing streams. What Captain Bower has really done is to give us for the first time direct evidence of the truth of the main features of that wonderfully great map which is due to Chinese geographers, and is a wonderful illustration of the extreme ingenuity of that remarkable people. You will, I know, thank Captain Bower for his extremely interesting paper, and recognise the courage and perseverance which has enabled him to carry through this remarkable exploration.

Captain Bower's Plants.—The following note on the plants collected during Captain Bower's expedition has been presented by Mr. W. T. Thiselton Dyer, C.M.G., C.I.E., Director of the Royal Gardens, Kew :—

Kew, *Feb. 25th*, 1893.

There were about one hundred and thirty species. The whole collection will be carefully worked out for the 'Annals of Botany.' There is a large proportion of Himalayan plants, including many described by Sir J. Hooker and Dr. Thomson, and Jacquemont, a Central Asian element, and a touch of North China. There are about half-a-dozen absolute novelties. One a curious new grass, *Agropyrum thoroldianum*. There is a new iris, *I. Thoroldi*.

Dr. Thorold says that the collection included every plant that he saw. In that case the generic flora must be very meagre.

Captain Bower's Map.—The position of camps marked thus ● was obtained by astronomical observations and dead reckoning. The heights were taken by hypsometer.

The map is reduced from official documents issued by the Survey of India Department.

FURTHER ROUTES IN THE EASTERN DESERT OF EGYPT.*

By ERNEST A. FLOYER, Leader of the Scientific Expedition despatched by H.H. The Khedive of Egypt.

It was not until February, 1891, that the Government of His Highness The Khedive decided to despatch an expedition to continue the explorations begun in 1887. Rendezvous was made at Assuan, where everything was prepared by the care of His Excellency Wodehouse Pasha, Governor-General of the Frontier; and on February 13th the expedition started. The existing maps contradicted each other on many essential points, and it was decided to follow that of the British War Office, which laid down one or two definite wells which the Arab with us recognised, and to which he was ready to conduct us. Abrak was a well which was known to have a great store of sweet water, and for Abrak we steered on leaving the Nile Valley. The first day we moved a short distance up the Bab el 'Ajjaj, the "Pass of the Sand-driving Wind," and camped to collect stragglers.

The rocks on either side of the valley, which broadened out at 8 miles from Assuan, were chiefly diorite, granite, and dolerite. At 14 miles the valley forked. We left the Hud † Valley on our right, and

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* See *Proceedings* R.G.S. 1887, p. 659. Map p. 480.

† The prophet Hud, identical with Heber, fourth in descent from Noah. His tomb is near Mirbath in Yemen.

followed the 'Ajjāj up a gradual ascent, until at 20 miles we quitted the rounded mass of Archæan rock, and opened on a broad sandstone plateau some 900 feet above the sea, sloping gradually down to 750 feet in the Allowi Basin, and thence gradually rising again. Here was the head of the Wadi Allowi, which springs some 10 miles to the south-east, and, winding over the almost level plain, goes north to join the Wadi Khareit, which falls into the Nile at Darawi.

On this route from Assuan to Abrak all the drainage, until the watershed is crossed, runs to the north. The small, shallow, water-courses, merely marked in the sand by a line of grass or shrubs, all run northward to join the Wadi Gharara, which is a large tributary to the

THE WADI HAMATA FAR FROM ITS SOURCE.

Wadi Khareit. The four principal valleys west of the watershed are the following:—

The Wadi Allaki, where are the gold mines described by Agatharchides, springs from the mountains of Elba, and reaches the Nile a few miles south of Assuan. This is the centre of one great westward drainage system.

The Wadi Khareit, springing from the Berenice Mountains, and reaching the Nile at Daraw, is the centre of a second drainage system.

The Wadi Abbad, springing from Jebel Abu Diab, drains a third basin; and the Wadi Zeidun, springing from the Jebel Sabā'i, and reaching the Nile between Kos and Kina, is a fourth. North of this is the Wadi Kina, described in the *Proceedings* of November, 1887.

While marching from Assuan to Abrak, we travelled apparently

over a boundless sandy plain; but in reality we were passing along the southern flank of the drainage basin of the Wadi Khareit. At 35 miles we left the last branch of the Allowi and entered sandstone ridges running north-west and south-east, with horizontal bedding, and some 300 feet of height. These ridges are a feature of this desert. Here petrified wood was common, as also 50 miles further on. The route over this sandstone plain may be readily followed on the map. Some uneasiness arose at the amount of southing made, and the wells of Abu Hashim were, if still ahead, far from their position on the map. They were reached, however, on February 17th.* From here the level sandstone plateau became more broken, and in 12 miles from Abu Hashim we reached the Wadi Timsa, so called from a long low bluff, something in the shape of a crocodile, which is the meaning of the word. Here in the rocks is a "galt" or reservoir, which holds water for a long time, but was now dry.

Passing over the undulating sandstone we crossed the broad Fileiti Plain, a desert among deserts, and approached more sandstone ridges always running north-west and south-east, and against whose flanks the drifted sand was piled up high like yellow snow, blown over from behind the hills by northerly winds. It was to no purpose that we climbed the highest points of the sandstone ridges, and searched the horizon for some prominent peak or land-mark. Sometimes in the far distance a peak or range loomed shadowy and blue. But the guide could not name them, nor could cross-bearings be obtained, except in one case, to Jebel Horuba (spear). On the evening of the 18th we climbed up a low ridge, crossed the watershed at about 1400 feet, and entered a broken country full of trees. The vast desert was at last at an end, and we were nearing Abrak. Here were many trees and shrubs, seyal, sellim, murkh, irta and shush, the last two most nourishing fodder, and the first most excellent firewood. This we had much needed, and that evening we camped in a fine sporting country and sat over a fire of logs.

We pushed on across the watershed and descended the slope, still on the sandstone rocks, and, on the morning of the 19th, reached the pools of Abrak, which we determined by astronomical observations to be 54 miles from their position on the map. But the position thus found was very close to the "Abiag" wells determined in 1878 by Mason, Colston and Purdy, American officers in the late Egyptian Army. "Abiag" was a misprint on the map; the word was correctly spelt in the report as Abrak.

Abrak is a picturesque valley, a cleft mass of sandstone wedged in between granite hills. The water-supply is probably permanent, and the place has been held as a strong place from the earliest times. There

* Details of the wells are given on the map.

are the remains of a large fort on a point at the mouth of the valley. Sandstone next to granite is in this country the surest combination for water. The granite throws it off and the sandstone absorbs it in its softer veins and in the pebble layers. Nor are the two pools mentioned the only supply in this neighbourhood. Skirting round the mass of Jebel Jambai, with Purdy's map in hand, we reached the grand Wadi Hothein which runs to the sea past the Jebel Ferayeg, the πεντεδάκτυλον ὄρος of Ptolemy Claudius. Here, at the foot of a lofty cliff, walling on the north the valley formed by the junction of the Hothein and the 'Anid, is a carved portal with an obliterated Greek inscription. The sockets are seen of beams which roofed in a spring of sweet water still maintaining two or three palm trees. A good engraving of this picturesque well is given by Linant de Bellefonds, who describes the place as an elephant-hunting station of Ptolemy Euergetes, B.C. 146. It is not, however, probable that elephants were found so far north in his time. It is possible that when the ocean surface of the world was wider, the monsoon rains spread farther north than now. The horse, cow, ostrich, and wild donkey, have disappeared from this country, not, however, by a diminished rainfall, but perhaps expelled by the camel. Um Safa, the modern name of the well, may have been a station on the road to the elephant-hunting countries in the south; and to possess elephants was a ruling passion with Euergetes. Since Alexander the Great showed their value in war, and since Seleucus, King of Syria, had received a present of five hundred from Sandrocottus, King of India, Egyptian rulers spared no pains to procure these mammoths from their own mountains. But they had no success, nor would the hunters of the south desist from the destruction of these animals, which was deplored then as now.

The valley Hothein (two pools), which, thirteen years ago, Colston found full of luxuriant shady trees, is now barren but for a few large rugged-stemmed calotropis. Purdy called the great cliff of Um Safa the "Istahkamat," or fortifications, and it was thought becoming to commemorate the name of the dead soldier and explorer by giving his name to one of the five "fingers" of Pentedactylon, now called Jebel Ferayeg. The southern peak is named by the Admiralty "Bodkin," and this great needle is a landmark for 50 miles round. The next peak has been inserted on the map as Purdy peak.

The Wadi 'Anid gives a route westward to the Dagalawi hills, and to El Gala, possibly some ruined mining station; and eastward, after its junction with the Hothein, it runs to the sea past the "Bodkin." The eastern or seaward route hence to Berenice had been laid down by Purdy's expedition to Berber; and a verification of his work near Abrak showed that little new could be found in his footsteps. So we started almost due north along the crest, heading for a mass of hills from which the great blunt cone of Abu Gurdi, 5000 feet, gradually rose into prominence as we approached. We crossed the Wadi Na'am, or

ostrich valley, and some of its affluents, and followed up the Wadi Beta'an to its source near Jebel Abu Dhaher, so named from its ridge like a camel's hump. Here we made an interesting discovery of a large mining settlement, the first of a great number which we afterwards visited. The place is called Um Eleagha, the latter word meaning a shrub, the *Vigna Nilotica*, which is found there.

The great ridge of Abu Dhaher is formed of a porphyroid rock. To the south-west is an undulating surface of clay and schists veined by thick dykes of quartz. Here, as was later found to be most usually the case, are traces of two distinct mining periods. The quartz veins have been burrowed out by an ancient people who lived in clusters of small stone huts; and after their departure, mines have been opened by European miners, who lived in a square-built town or barracks. The neighbourhood of a mining town is first denoted by scattered remains of stone huts. These may have served the sutlers, or hangers-on of the settlement. Somewhere near the main shafts will be found a square or oblong-walled enclosure perhaps 300 yards square. Then the temple must be looked for, and it is sometimes difficult to tell whether the temple was left incomplete or has fallen in ruins.

At Um Eleagha, we first noticed small stone huts; and, on inquiry, were told that near the mountain were "kufra," ancient ruins. The etymology of this word is too curious to be omitted; it is given by Doughty in his wonderful 'Arabia Deserta,' which reads like an old testament of modern days. At Medain Sali are found some vast sepulchres of a pre-Islamic race. They are described by the Arabs as the houses of the Kuffar, or Kufra—that is of unbelievers who lived before Muhammad's divine missions. The same word has thus come to mean ancient ruins and unbelievers. On hearing of the Kufra we at once halted, and after a short search found the town, or barracks. The shafts were some hundreds of circular holes, from 10 to 25 feet deep, and had been much deeper before they were filled with the sand of centuries. They were scattered about thickly over an undulating surface of green granite schist. One shaft descended very steeply in solid-green granite and had a square-hewn mouth. No conclusion was come to as to what the miners were in search of; but the quartz veins which crossed the plain had clearly been worked for gold.

The temple could not be found, and remains to reward the future traveller. It was described, after we had left the place, as, "a large building, plastered." We pursued our route northward over a desolate sandy land. Here and there were "rothas" meadows, or flat sandy depressions, well stocked with "shush" * grass, on which grazed scanty flocks of sheep and goats. The nights were cold on the crest, at a height of about 1400 feet. Here were huge cones of quartz, regular

* The botanical names corresponding with these Arabic names are given on the map.

in shape, 300 feet high, and of a delicate rose pink. Approaching the mass of Abu Gurdi the rocks took a peculiar form, which prevails largely over the crystalline area, and which will be referred to as "cataract rocks." Strabo noticed this peculiar rock on his waggon ride from Assuan to the cataract, and described it in detail. Colston writes, "One would think that here had been a cataract." The rock is a coarse grey granite; the felspar and mica crystals very large, the latter causing it to disintegrate very rapidly. It is worn away into caverns and potholes in a way suggesting immediately the action of water. There are curious stains on it, compared by the Arabs to leprosy. They are caused by a larger proportion of hornblende, the quantity of which in the main mass is very small.

After rounding the base of Abu Gurdi the Lehema joins the Safint, and the two roll down a broad stream of boulders, and, once every

WADI LEHEMA.

five or six years, of water so deep and rapid that though a camel may, a man may not cross it; such a "seyl" lasts for two days. The Wadi is thickly planted with fine seyal trees.* The boulders in the upper part diminish gradually to gravel, and sand in the lower parts. Some days were spent in examining this and other wadis flowing seawards from the Berenice Range. They all flow north-east, and all seem to be fissures in the primary rock partly filled by detritus. We marched eastward, and on the night of February 28th we climbed up the highest peaks near the camp, but could catch no glimpse of the Red Sea, which one of us was to see for the first time from the ruins of Berenice.

There is very little to mark out Berenice in the flat sandy plain.

* The name "Lehema" is the Abyssinian name for Taberna Montana, which probably grew in this valley.

Belzoni, who found the site in 1819–1820, had extraordinarily good luck. Two or three outcrops of cataract granite were a disappointment from their resemblance to ruins. At last, a little before noon, our camels were stopped actually on the roof of the temple. This had been cleared of sand by Purdy in 1878; but was once more nearly filled up. All around the traces of houses were like heaps of stone roots. Blocks of coral in this form had been employed as stones, and now had the curious appearance of heaps of roots.

Berenice was supplied with water by a large reservoir built in the bed of a neighbouring wadi, according to the plan made by Purdy's expedition.

The great truncated cone of Abu Gurdi bore due west from the ruined town, and turned the whole drainage east of the watershed in a north-east direction. Around it lay a great mass of lesser mountains, among which was conspicuous the Batoga Peak of light buff colour. Both north-west and south-west are forts of massive strength, indicating the passage of caravans of precious metal from both directions, and that the passage was dangerous owing probably to attacks by the Blemmyes, the Hamitic wanderers who held these deserts.

It was interesting to find here a range of mountains called the Jebel Aidab. Curiosity had been strongly excited by long stories in the Arab historians of the tenth and eleventh centuries about the Port of Aidab, which was not to be found on any map. From Aidab to Jeddah was but a day and a night's sail, and for two hundred years—1060–1260—the Kos-Aidab route carried the whole pilgrim traffic; and still for a hundred years longer it carried all the merchandise from the East. The probable position of Aidab is discussed at great length by the Arab geographers, Ibn Haukal doubting whether or not it is in Abyssinia. It may be that this is the real site of the old town. If so it is curious that it required two expeditions to actually place it. Purdy, coming from the north, marked "ruins of an Arab town." We, advancing from the south, rode along the flanks of Jebel Aidab, at the foot of which lay the ruins of Aidab. But, on reference to Von Heuglin's map, it is found that Aidab is a very common name on this coast, and may even be a word meaning mountain. Thus the identification is incomplete.

From Berenice we moved north to the point where the W. Lehema leaves the hills and makes a broad line of stunted shrubs to the sea. Abu Geraia, the place (father) of the hamlet, is a fortified station at the mouth of a narrow valley. The well (dry) is 1½ miles up the valley from the station; and the cliffs overlooking it are cut and built into ambushes for sharpshooters. Here was a clue to the meaning of a tall tower near the deep-built well at the quarries of Mons Claudianus. This tower, now inaccessible, and without staircase, has puzzled

travellers.* It was probably manned by watchmen, who were drawn up by a rope into the upper chamber, and who shot with bows at those who would draw water without orders. From here the expedition began an examination of the mass of hills which may well bear—beside the native name of each hill, the collective name of the Berenice mountains. The chief peaks are Abu Gurdi, Aidab, Safint, Um Selim,† Hamata, Hullus, and the twin peaks of Hamamid. Marching up the broad W. Lehema, a small hill to the right was called Jebel Zayetit This is probably the "etit" of Schweinfurth, and the "Outidh" of the French War Office map.

We proposed to camp in the well-treed Wadi Lehema, and await the arrival of some photograph apparatus which was following from Assuan. Here, in spite of the guide's denial, we found a galt, which contained 13,000 gallons of delicious water.

Three days were spent in taking bearings, and Haji Mansur proved a capital geographer. It was a keen pleasure to him to carry the plane-table up the highest hills from whence the greatest number of peaks could be seen. He was never at fault, and would name the hills and state whether the drainage ran "sahil," coastwards, or "dhāhir," westwards. Something he knew, too, of geology; and could name granite, schist, slate, quartz, mica, limestone, and sandstone. He could not, however, go wholly with modern science. On the relative ages of rocks, modern science must take its way; he reluctantly turned aside, and stood aloof. The granite might perhaps be a thousand years old and the sandstone perhaps a little more. Argument he answered by donning his scarlet coat, a robe of honour from the Khedive, and thought that a self-respecting sheikh must not be teased by obvious fables. One evening with his help we actually rode down, on camels, an ibex. But the old veteran was dying of age. His knees had pads like a camels, and his beard was a foot long.

Having completed our instruments the party divided. The main food supply started for Haratreit well. I went round the mass of Abu Gurdi to the source of the Wadi Khareit, and thence across the difficult Mikbia' pass, and joined the party at Haratreit, where it was cool lying (we had no tents) under giant boulders of grey granite. The Mikbia' pass, 2500 feet, is difficult, and, if loaded camels are taken across, it must be one by one, with many camelmen, and camels accustomed to hills must be chosen. There are some fine bold passes in the Wadi Mikbīa'. The Haratreit Valley was cut very deep into the soft grey granite,

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* See *Proceedings* R.G.S., November, 1887.

† Um Selim, mother or place of Acacia Ehrenbergiana, a common name for mountains and perhaps the origin of the Solymi mountains of the ancients.

τὸν δ' ἐξ Αἰθιόπων ἀνιὼν κρείων Ἐνοσίχθων
τηλόθεν ἐκ Σολύμων ὀρέων ἴδεν.—'Odyss.' v. 282-3.

and for geological purposes we followed it to the sea, where was a fine grove of avicenna, containing trees some 4½ feet round the bole. It was a curious forest there in the shallow sea. The bright green leaves shone in the sun. Curlews, and other waders, wandered tamely about, and far away over the flat sea—there are no waves on these coral protected shores—were two or three tiny canoes of fishing Ababdi.* These fishermen watered at our well, 9 miles inland, and came there with water-skins on camels and donkeys. They had perhaps a story to tell, but the knowledge of ships' wreckage stored in their huts, added to an instinctive reticence, prevented anything coming from them. They were small, dark-coloured, and scanty-bearded; active and well made.

Travelling now from Haratreit, over low hills and broken slopes of granite, we struck the Wadi Hamata,† and turned aside to visit the great mountain of that name, which means a wild fig, and is probably referred to the shape of the mountain, which is 6000 feet high and dome-shaped, or like an inverted fig. The summit was wrapped in fleecy clouds, and the view that morning was grand and picturesque, but could not be reproduced by a photograph.

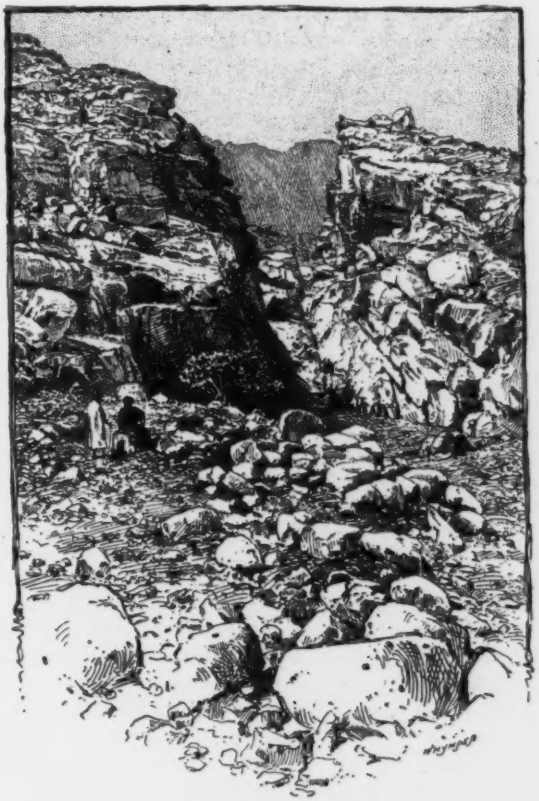
Nearing the hills the boulders became very large, and the camels moved very slowly. Here was a ragged Abbadi hut, sure sign of water, which indeed we found plentiful, but green. A broad ravine, floored with polished gneiss, runs down the mountain side, making in its smooth bed three or four waterholes, of which the largest held 600 gallons. But alas, many things beside water had been swept from the torrent bed into these caves of water, on which floated a green scum. The cleft through which this water passed, an outlying reef of granite, was hung with Moringa and Capparis Spinosa, the former being here called El Mai, not Yessar, as further north. The basaltic rocks in this ravine ring to the hammer like iron.

Back from Hamata and into the road we marched along the eastern flank of the igneous range over granite of varying coarseness and generally grey, but sometimes of green of different degrees of brightness. The hills of Hullus and the twin peaks of Hamamid appeared some 20 miles off over a sea of "cataract" rock, which, on the morning of March 13th, gave the camels some trouble before we climbed down into the valley of "beauty," the Wadi Jemal. Whether Jemal here means camels or beauty, must be left undecided; the fine Higlik and Murkh trees would support many camels, and a camel is the Arab synonym for beauty. An Arab widow mourns her husband with the cry of "Oh, my camel!" The Wadi Jemal is the largest and greenest of the coast valleys, and receives the main drainage of the hills from

* Abbadi, pl. Ababdi: for etymology and history, see *Journal* Royal Asiatic Society, Oct. 1892, "Mines of the Etbai."

† In the old geographers this mountain bears the Hamitic name of "Karkashenda," now completely disappeared.

Hullus in lat. 24° 10′ to Nugrus in lat. 24° 50′. Climbing down into it by a steep ravine we found here many ruined houses. Large walled enclosures had evidently held cattle. The Ptolemies used no camels, and the fact that they were close to the hills and partly carried away on the Wadi side, showed that great seyls or floods took place when they were built. It is curious that, with all the maps which had been examined



GORGE AT HAMATA.

before starting on this journey, we had yet no notion that we were close upon the houses and temples of perhaps the oldest and most extensive emerald mines in the world.* This in the Wadi Jemal was clearly an outstation where were kept the bullocks which served the

* These emerald mines were the only ones known until the conquest of Peru.

caravans between the emerald mines and Berenice. The question now arose should we go to the wells of Abu Had, or visit more ruined houses in the Wadi Sikait; but in the latter word I recognised the "sekket bundare kebeer" of Cailliaud's map, which I at once took from my pocket. We left the Jemal and rode up the Wadi Sikait, and soon halted under a ruined building imposingly placed on a spur of rock, and opposite an apparently older temple carved in the rock in the northern flank of the ravine. Guided by Cailliaud's map we set out to find the mines. This was not difficult; after some 3 miles along the wadi, with ruined houses on either side, the mines began to appear like great rabbit burrows, and from each came a stream of silver-grey powder. When the valley turned to the left, under a high hill of mica and mica schist, there were paths and mines and streams of excavated stone. Again to the right were more mines. The mica was so plentiful that the hills felt underfoot like rotten wood. Some hills were of thin flakes

EMERALD MINES.

of sandstone set on edge, and looked like mountains of brown paper. Watch-towers and magazines were posted on prominent peaks, and well-pitched paths wound in every direction. Night overtook us wandering in pleased research, and we were glad that the forethought of Haji Mansur brought camels when he came to look for us weary with the weight of samples and camera. There was much to do here, but we were without water for a long stay. Moreover, to the south many geographical points had been left unexamined from our inability to climb the range from the seaward flank, so we moved back to the Jemal and up the Wadi Hafafit which skirts the Jebel Hafafit, a low range which, as the name indicates, you must "go round," and so to the large and bitter well of Abu Had, placed, like so many wells, on the very crest of the watershed. It appears that on the crest the rain collects between the impervious granite peaks, and is preserved from the sun by a covering of sand, but on either side of the watershed it runs down the slope and sinks too deep to be found by digging. Here I left the baggage with orders to go

south to a well called "Bir Khashab," of which we had heard; and, taking provisions for a week, I started with Haji Mansur down the long slope to the Wadi Jemal. Then up the Durunkat between two ranges, of which that on the seaward side was impassable, even for men on foot. We mounted rapidly, passed a well-built tomb of Sheikh Ali—an old villager of consequence—and halted at noon by a fissure in the granite, where was excellent water in a succession of rocky pools. Here are examples of a sandstone changing gradually into a granite, yellow first and gradually becoming green where near a vein of hornblende. One block may be seen which is a clear sandstone at one end, and a green granite at the other; it has even the "leprous patches" so common in the "cataract" rock which has been described. There were scattered huts in this well-treed valley, and the people had donkeys, goats and sheep.

The children wandered about with long crooks, and the sheep followed them about eagerly expecting the shower of leaves which were shaken from the acacias, and which formed their only food. These people are Asha'bab—*i.e.*, dwellers in Shi'b, ravines, or creeks, and their wasm or camel brand is the junction of two ravines. The Seyal trees are of the first importance to them; for, except these, there is nothing for their cattle to eat. Well-established old patriarchs with children to follow them preserve the trees most carefully, never cutting the branches, but serving themselves only with such leaves as are shaken off by the shepherds' long crooks. But a family who have usurped another's valley, or who are perhaps merely shepherds of sheep of some rich Nile-dweller, will cut down every branch and finally burn the trunks into charcoal.

When the Durunkat came to an end we crossed a small "divide" and dropped into the Wadi Jemal, here, in its upper portion, called the Wadi Hullus. Here was a good example of both styles of farming. The trees were merely mangled stumps; there seemed hardly a bough left for the sheep, mangy from starvation. But presently across the path was drawn a line, merely a scrape with the hand. This was the land-mark between two families. Above this the leafy trees spread out in gracious verdure. Here was intelligent farming, fat donkeys, camels with swelling humps, and grave grey-bearded old men. These were Sheikhs Abdullah and Koraim, Haji Mansur's uncles. They had dwelt all their lives, as had their fathers before them, under the shadow of the mighty Hamata mountain. I spoke warmly in praise of their thrift in preserving their beautiful trees—even Haji Mansur might not cut for our camels. But the effect of my words was unfortunately undone. Later on we met "pillars" of locusts, and disaffected members of the caravan remembered with scorn my praise of Koraim's trees. This use of the word "pillars" of locusts is curious, and is perhaps drawn from the tall

sand "pillars," which are whirled about the desert in times of storm. Anyone who has watched one of these tall sand pillars rotating with inconceivable violence, advancing all the while slowly but irresistibly in a dead sultry silence, must admire the majestic thought which placed such a pillar as leader of the Israelites. The rocks here are scored with rude pictures of camels, ibex, men with bows and arrows, ostriches, and cows with crescent horns.

This evidence, independent of history, proves these animals to have lived here in former times. We left our camels in the valley at an altitude of 3500 feet, and proceeded to climb up the lofty porphyry peaks which closed in the eastern end. Here might be the caves of Æolus, and small gusts entangled in the narrow clefts make most violent efforts to escape. From the top was a grand view over mountain and valley, over coral island and wide blue sea. Immediately below us the cliff fell sheer 1000 feet, and steeply broken, twice as far again. From its foot the Wadi Kashir wound through rugged hills towards the plain. Haratreit and Lehema lay in the distant panorama, and the low Jezira range, ending in Ras Benas, indicated the situation of Berenice. This wall of porphyry was 6 miles broad, and the next day we turned in our tracks to the west and picked our way down the steep pass of Helgeit into an amphitheatre of hills, whence a long march over a stony slope led us to the low ridge in which lay the ancient masonry well of Helgeit, containing a reputedly inexhaustible supply of alum-tasting water. We were now in the catchment basin of the Khareit, and "Stonehenge," by which name any one will readily identify a cluster of worn granite rocks at the foot of the Mikbla' Pass, lay in the distance like an abandoned town. Down in the middle of the valley we climbed a hill. All around was a panorama of hills, delightful after the long wandering in the walled valley of Hullus, and all named by the guide, whom no surprises or cross-examining could shake in his nomenclature. The top of the "bodkin" appeared clearly over the horizon, and far away to the south rose the pinnacle of Hamrat Mukbud. Hamrat Mukbud, as seen from the heights over Abu Had, had been chosen as the right place to begin the plane-table survey, if, indeed, it should be possible to climb it, of which the guide spoke doubtfully. Abu Gurdi and the Bodkin were both fixed by the Admiralty, and with these Hamrat Mukbud formed a triangle, with sides of 32, 52, and 76 miles. The longitude of Hamrat was independently fixed by dead reckoning and by chronometer, and the latitude by repeated Polaris and south transiting stars. From Hamrat "Kullho Abbadi," "all is panorama," and a line of north and south peaks down the middle of the country, intersected by latitudes by polaris, would keep a map correct whatever might in the future happen to the chronometer longitudes. We moved up the northern flank of the Khareit, crossing many of its affluents and keeping the massive Abu Erghub on our right. We were for some miles just on the

dividing line between sandstone * and metamorphic rock, which swelled up in bare patches through the talus of boulders, which made the track bad going for the camels' feet. Jebel Khafa stands forth into the desert a bold mountain outpost, and between it and Abu Erghub on the main mass runs the Wadi Majsus, affluent of the Khareit. Here the march was slow, the road was so stony. We crossed the Um Daisha and then to the Wadi Sheikh Shadli, where stands the most important tomb, well, and intelligence station in the country. Close by here passes the main caravan route from Assuan to Suakin, and we approached the large stone building with much interest.

It was a pleasant solitude. The valley ran up into the hills, and the trees were not mutilated. The water in the shallow, slowly-filling well was sweet.

A young Sudani kept the tombs, three in number, placed in a walled yard. His little son was as thin, and as black, and as bright and active as can be imagined; and we left him running off to his mother to enquire what manner of thing might be a gold coin which we had placed in his tiny hand.

It was now six days since we had left our party, and it seemed a doubtful matter whether we might find them readily in this unknown wilderness. But, on entering the Wadi Khashab, there in the distance stood the well-worn camel-trunks in the shade of a rock under which we camped. Five or six wells here were dry, save one holding a little brackish water; but, as he had done at Abu Had, Haji Mansur fetched excellent water from a little distance. The rock here was a curious green "pistachio breccia," a green matrix enclosing light yellow blocks. It was a volcanic breccia. Hamrat Mukbud stands straight up 1600 feet from the level sandy basin of the Khareit. The centre pinnacle cannot be climbed, but the shoulders are high enough for observations, which are not without danger from sudden blasts of wind. Two nights were spent in taking latitudes, and the next station chosen was Jebel Mij'if, 40 miles to the north. Far away over the boundless sandstone plain to the south showed up the heads of Dagalawi and Na'aja. On the western horizon was the Jebel Suffra, and on the east the main range of Abu Gurdi, Safint, Hullus, and Hamata.

In the Wadi Khashab are many ruined villages, and the explanation of their presence appears to be in the topaz workings at Rizk Allah. The systematic workings of probably Ptolemaic miners have been obliterated by the persistent search of the modern Ababdi. They turn over the surface boulders, and scrape in the soil for what they may find; and I was told that the women on the Nile wore topazes from these hills. We wasted a day in the search. The hills that have been thus treated have a curious ploughed appearance, for the boulders on

* See Q. J. G. S. Nov. 1892.

the weathered side are all of an uniform brown colour, but where they have been overturned, the green side is exposed to view.

I left the party at Khashab with instructions to proceed to Mij'if, taking on their way Sikait, where the artist was to photograph some inscriptions which he had detected only just as we were riding away. I rode rapidly down to the Nile to get fresh time data from the temple of Kom Ombos. It turned out afterwards that the longitude of Kom Ombos is one of the places on the Nile for which the authority is lost. Nouet, whose observations are given in the *Decade*, a scientific paper published in Egypt during the French occupation, is followed closely for all Nile longitudes north and south of Kom Ombos. But Nouet places Kom Ombos 14 miles to the west of its position on modern maps. The authority for its present position I have not yet found, but this, the only departure from Nouet, demands investigation.

We rode due west through low hills of vertical laminated slate. These were covered with long strips and shreds which made them resemble hills of black "tibbin" or chopped straw. Then came "cataract" granite which changed to a reddish syenite, and the first night's camp was on the line where this disappeared under the sandstone. We crossed the Antar and its affluents, all draining into the Khareit. Then we entered the Wadi Muktil between two round hills of sandstone over blue clay, and this led us into the broad Wadi Natash which runs between sandstone cliffs, from 100 to 250 feet high, under which showed blue clay. Natash is the Arabic for Crotalaria Ægyptiaca, but this plant is not now more found in this Wadi than ostriches are found in the Wadi Na'am or "Ostrich" Valley. But the Wadi is interesting geologically. It appears that the water has percolated through the blue clay, and thus undermined the sandstone which falls in huge boulders from the cliff on either side.

"Haguban," plural of Hugab, boulders, is a useful word, and generally indicates a shady nook to sit under. Many boulders are hanging from the cliffs, some as large as railway waggons, ready to thunder down. The soft smooth surfaces are scored everywhere by crude drawings of horses, cows, bowmen, troops of ostriches, ibex, camels, and men. The sandstone range through which we are passing sinks gradually to the west, and the blue clay disappears below the bed of the Wadi.

We left Bir Khashab on the morning of April 3rd; by noon on the 5th we had reached the absolutely flat desert. In the evening we camped due west of the Nasab Nugra, a pyramidal bluff of sandstone, which forms the landmark which guides all caravans coming over the flat plain, which reaches from here to Kom Ombos. All the next day we rode over this dreary plain of light, friable sandy mud. During the whole march the aneroid only altered from 260 feet in the morning to 120 in the evening. Here we were in the bed of the Khareit, and near its junction with the Allowi, the source of which we had seen when

leaving Assuan. Due west is a slight rise in the plain, which curves the Khareit to the north. On the morning of the 7th we rode into the Nile Valley at Darawi, the aneroid coming steadily down to 10 feet at the river bank. Here is a wonderful great plain, surely more worthy than Luxor to be the site of a great city. Was it, perhaps, too near the ferocious Blemmyes for people here to lay out wealth in irrigation?

After an evening spent at Rakaba, in telegraph communication with chronometers at Cairo, in observation of the stars, we left again the next morning and steered a north-east course over this great plain, aiming for the confluence of the Khor Shaid with the Khareit. This we reached the first evening, riding over a plain of good soil, with occasional banks of pebbles. About 14 miles to the west a sandstone range ran north-west and south-east, perhaps 600 feet high. The Shaid cuts through the sandstone plateau just as the Natash does. We rode up this fairly shrubby valley till noon on the 10th, when we took the Wadi Sibrit, which cut off a large bend, and brought us to a well of sweetish water said to be never dry. The water was 14 feet from the surface in sandy earth. Having watered the camels at the Sibrit well, we pushed on to the gold mines of Hamesh, near the confluence of the Hamesh and the Shaid. Here was a large station, and the thick vertical quartz reefs had been worked to apparently great depth; but without ladders it was impossible to go very deep into them. The quartz lies about the mouth of the shafts in measured heaps. It is very brittle and generally of a rusty colour. This must have been a pleasant station in the winter. The trees in the valley average some sixty or seventy to the mile, and the ground was covered with basilla and other shrubs. The shepherds here brought water from the Sibrit well. The old sheikh grumbled at bad times, no rain, mange among his sheep. But it seemed to us that he spoke more in dread of exaction than in suffering from loss.

Riding to the north the country opened out at 1100 feet, and shallow wadies converged from all points to make the Hamesh. Here is the laminated clay—a broad belt, for the dip west is very slight; and, though the clay be only perhaps 300 or 400 feet thick (we did not see the bottom of the bed—under the cliffs of Natash it was nearly horizontal), still the angle with the horizon is so small that it spreads out over a breadth of 3 or 4 miles. On the 13th, ten days after leaving them, we rejoined our party camped at the mouth of a ravine, a branch of which contained the deep well of Mij'if. Riding up over the vast sloping plain, we saw the unaccustomed luxury of a tent. This had been sent me by my good friend Herbert Pretyman. He had just returned to Kina from an ibex shooting expedition in the Kittar Mountains to the north, and his was the kind thought to send me his tent. He died but a short time afterwards, regretted by literally every one who knew him.

Home is home if it is only a box full of dictionaries and tinned provisions—which is practically what it was, now plus an excellent tent. The artist, however, had fallen ill, nor had he been able to photograph the Sikait inscriptions; and he returned to Cairo as soon as the letters were ready for the post.

The well of Mij'if has a narrow mouth coped with large boulders, and is some 26 feet deep. It fills slowly, and we were unexpectedly delayed at starting by a party having drawn all the water just before we sent to secure our supply. The plane-table here gave us few rays to the east, the view being blocked by the mass of Jebel Nugrus. But the next peak to the north was an excellent landmark, a granite boss some 1200 feet high called Abu Diab. Mij'if is on the crest; as described by Haji Mansur before we reached it, "Mij'if in the morning throws its shadow to the west, and in the evening to the east of the watershed." We planned on leaving here to go first seawards, and then south to the emerald mines, and a rough road we found it. But first we visited a Roman Caravanserai 5 miles to the south, identified by Colston as the Aristonis of the itinerary. It lay close by the Dueik, which falls into the Shaid, and differed from the massive forts to the south in being of slighter construction. Outside the square enclosure, containing rooms and a cistern, stood a smaller building. It was just the Caravanserai and Chapar Khana, or Post House, of Persia. It was Euclid who told Ptolemy that there was "no royal road to learning;" and the reference was to the roads along which were post-houses with their relays of fresh animals, as distinct from caravanserais, where the original caravan rested and went slowly on its way refreshed. The road was the same, except where a mounted man might save distance by a path impassable to loaded animals.

On the 18th we left the camp, reduced now to a couple of trunks and a tent, and rode north across the sources of the Mueileh. Within a mile of this west-flowing Wadi are the "tails" of the east-flowing Um Khareiga. Then we rode south, across many affluents of the Ghadir, a Phœnician name, identical with Cadiz and meaning "enclosure" or "pool." This, when joined by the Abiadh and the Zabbara, becomes a fine, well-treed shingle stream.

On the morning of April 19th we entered a curious formation of green micaceous slate. To the south rose some 1200 feet, the mass of Jebel Zabbara, and here we camped amongst the old stone houses of the Albanian miners employed under M. Cailliaud in 1819. It was a curious and picturesque place with many good trees and sheep feeding. From under the black bluff of Zabbara ran two long spurs, or banks, of green mica schist, quartz, and limestone in complicated tortuous bedding. In these banks were the principal shafts; and, under the mouths, the valley was cumbered with mounds of shining silvery ore.

The Albanians were worse house-builders than the Romans, but

they were better miners. The ellipse-shaped stone houses here were rude compared with the villas and barracks at Sikait. But the rabbit burrows there were replaced here by square straight shafts, with ventilation; one of these we now prepared, with some misgivings, to descend. At 10-foot intervals were wedged across the shaft stout boughs of trees. A steep slope at first, and then a drop, then a further slope. My Egyptian servant, Byumi, went down first, and took out in all 430 feet of string. Here, neatly placed in a row on a low chamber, were baskets of ore, one of which was with difficulty brought to the surface. It was curious to note the Egyptian promptness to go down a mine. The Arab could hardly be got inside to hold the end of the string and a lamp. The Englishman was vaguely afraid of "treading on something," and descended only under a sense of duty. But the Egyptian climbed down full of glee, and when he got to the end of the string he tied it carefully to a rock and went on without string.

At the end of the ravine was a galt where Haji Mansur said he would go and shoot an ibex, which he did; it was afterwards cooked and eaten, to the complete prostration of the party on the morrow. It is worth knowing that ibex are not safe eating where there is artemisia in the valleys. My botanical knowledge saved me, but I had a dejected following when we started over the stony slopes to climb round the south-eastern corner of Zabbara. It was a long day's march and included some steep work for the camels. The mass of Zabbara is, I think, the blue clay tilted up by the igneous up-thrust, which probably supplied the heat which metamorphosed the sandstone. The question of the relative age of these rocks has been discussed elsewhere. Interesting indications were observed that the sandstone plain extended across the ridge, while masses of it are caught, as it were, between the higher peaks. The quantity of mica is prodigious. At the foot of the eastern flank is seen the grey "cataract" granite which underlies the blue clay. We climbed over the blue micaceous ridges, honeycombed everywhere by mines, and dropped into the Sikait Valley and slept that evening on our former camp. It was disappointing to find no vestige of inscription in the built temple, or perhaps church. Those over the rock-cut temples were copied, but alas, we were some five hundred years too late. The soft friable sandstone, in which the Greek was cut, had worn away.

The Rev. Canon Wright, of Coningsby, translated what could be deciphered as a dedication to Isis, Apollo, and all the gods. A reference to ὀρυγας, ibex, and βερενικης was unintelligible.

We left by a route up the valley, and, turning west under the principal mines, we clambered down into the Nugrus Valley and marched north-west between the Nugrus and Hafafit ranges. Thus we had four routes to the Sikait mines, but yet we did not know the route between them and the sea. Here interesting matter might be found either by the Wadi Jemal, or by the Wadi Ghadir route. The

Nugrus and Hafafit ranges nearly meet at the north, and only a narrow torrent bed divides them. On this march the stratification was very clear—the metamorphic over clay or slate, and clay over grey "cataract" granite.

From our old camp at Mij'if we started west and passed between some huge bosses of coarse, whitish granite, in which felspar predominated largely. These start sheer out of the level plain and are called "Mudarghag." Thence we travelled north over a level plain, or "Rotha," and camped in the "tail" of the great Wadi Beza which springs from the Jebel Abu Diab, a fine plane-table station. From here we marched 8 miles west down the Wadi Beza to the post-house of Feisoli, a somewhat Roman-sounding name. Thence we crossed a low range which, though insignificant, formed the dividing line between the drainage-basins of the Khareit and the Abbad, which latter reaches the Nile opposite Edfu. A violent burning wind scorched us up this 26th of April, and, indeed, for the ensuing month we suffered a great deal from the heat. Not only in person, but in surveying work also; for the sun and stars by night, and often the whole prospect by day were obscured by haze, delaying observations. Three miles west of Feisoli, but in the Abbad basin, is the large Caravanserai of Abu Geraia. We were now on the route of Colston, who identifies this station as Compasi.* Here amongst the vertical clays and shales were pockets of limestone, advantage of which had been taken by the Romans to cement the huge tanks built of good burnt-brick masonry.

From Abu Geraia (the second of the name) we crossed low sandstone hills into the Wadi Miah, a broad and deep affluent of the Abbad, and followed it up to the gold mines of Sighdit, in the Wadi of that name, which is a small branch of the Mia. Haji Mansur derived Mia from Ma, water, but was corrected by a resident who derived it from El Mai, a southern synonym of "Yessar," the Moringa Aptera. There were in the valley neither water nor Mai trees. The mines of Sighdit are close to the Hedalawi hills, which merit some description. They are low regular mounds, some three to five hundred feet high, of what Mr. Henson calls volcanic breccia. They present much the appearance of a soft, brown cushion with deep depressions formed by tightly sewn buttons. They might be called "mammillated." Here, as in Arabia, they are called "Ginna," and they suggest that an area of sand-hills had been fused into rock.

The Sighdit wells, reputed inexhaustible, contain excellent water, the best we had drunk since leaving the Nile. The water is held up in the valley probably by a dyke of rock under the present bed. Sand-

* A station called Sarbut was spoken of as one day's journey to the west of Abu Geraya. There is also a Sarbut (? Sarmount) Kadīm in the Sinai peninsula. Capt. Godby, R.E., writes from Akaba that "sarbut" means an "outlier" or "temoin."

grouse and partridges came in great numbers to drink. The Amnoperdrix heysii, with a tuft of white feathers over each ear, in the male only, was here common. Blue pigeons were as tame as at the well of Abu Had. Over the well in the face of the rock is a hieroglyphic inscription, merely scratched on the surface, recording the visit of a royal scribe and of a superintendent of the mines. Hither from the East came, during our stay, Sheikh Said with some twenty young camels bursting with fat, which he was to sell in the "Rif," the universal name for the Nile Valley,* and a caravan of wheat arriving from Kos at the same time, the place assumed a busy air. Sheikh Said was willing to give any information in his power, but he had a way all his own of baffling his enquirer. He would listen with great earnestness to my questions, regarding me all the while as if he was studying a wild animal. Then he would pause, seize me by the arm, and in a voice of deep emphasis ask *me* a question. His fat camels had been in a valley where rain had fallen, and had found sweet "gash" or short grass, that which is so much more fattening than any shrubs. Sighdit is a good example of two mining periods. For a mile along the valley by the wells are hundreds of little stone huts; they differ from the modern stone huts now built by the settled Ababdi in this particular. The ancient walls are two defined faces of large stones with the intervening space filled by pebbles. A modern wall has but one line of stones; it is, so to speak, a one-stone wall, and the interstices are filled with mud, old rags, mats, etc. This at Sighdit was an ancient settlement, though the mines in which they may have worked were not found. Three miles away from the wells are the extensive ruins of a Roman settlement. Here the quartz veins have been largely worked. There is much to show that the Ptolemaic miners established themselves wherever they found the Troglodytes had been working and there results from the geological study of the country little doubt that the Troglodytes of Herodotus were "miners" not cave-dwellers.

Our two caravans departed, one east, and one west. We left for the south in search of a, so far as we could find, non-existent Jebel Rusas or mountain of lead. Something there was, however, which upset the compass in this neighbourhood; it was sometimes deflected 40° to the west.

We rode round the south of Um Nagad (a plane-table station), over a broken plain, through which uprose blocks of "cataract" granite, and, falling into the Wadi Bararig, we rode down between its oven-hot walls, 60 yards apart and 50 yards high. Um Nagad was a cluster of "bosses" of pink felspar without mica, and the coarse felspar sand streamed down from its sides like pink snow. Some attempt we made

* "Rif" means "cultivated land." The term in Northern Africa has been thought of as originating the English word "ruffians."

to identify the "crimson mountain" of ancient geographers. The difficulty lies in the number of hills to which the preponderance of coarse, deep pink felspar gives the "crimson" qualification. Few words have changed more than the meanings of colour names. The ancient porphyry is not purple nor was the Roman's crimson the colour of a modern soldier's coat.

We were now approaching a mass of hills which bore the curious name of Kodaboro. This name, so proper to the Sudan, appears most unsemitic.* This is one of the names that suggest that the Troglodytes, the pre-Ptolemaic miners, were the Negroid iron-workers who now work minerals in the hills to the south of Kordofan, a race of great character, who gave kings to Darfur. Kodaboro sent a stream of bright pink sand into our Wadi Bararig, and here was a rare thing, a stream of running water, brackish and flowing through tall rushes. It was not unpleasant to the taste, and our camels drank it freely. Nor was there other water for the Ababdi, whom we passed on the road. With them was a man from Kosair, astonished beyond measure to see an Englishman. He solemnly ejaculated "la illahi ill' allah" with such disjointed deliberation that none of the party could contain their laughter.

At noon on May 4th we were at the confluence of the three Wadies: the Bararig, down which we had ridden; Imbarak, whose "tail" was at Abu Diab, opposite Beza; and Kodaboro. The valley was in places 600 yards broad, and the little geological sketches of the hills inserted on the sketch-map look as if they were drawn with a comb, so regular are the wavy lines of the vertical laminated slate.

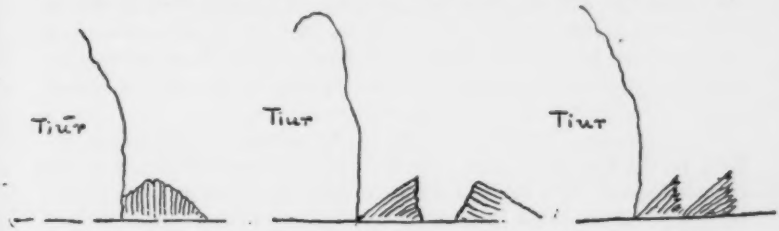
Here were houses, increasing in number as we advanced. Further on a ruined town 400 yards long by 100 yards broad, mining shafts, paths about the hills, and heaps of quartz-pounding pestles. We were near the sea, and the damp air was unwelcome, seeming to unstring the frame. Presently the great Imbarak debouched on to a limestone plain, the valley walls of black slate seeming to sink under the shingly surface. Here we turned sharp round to the north and entered a creek in the hills, and in a short time the camels knelt at Um Rus.

A broad quartz vein traversed the eastern cliff, and in this a shaft had been sunk. In this mine lay the water. Wonderingly we crept in, and the flickering candle showed a broad flat cavern, just the height of the quartz vein's thickness. Down the steep slope we scrambled more than 100 feet, and there lay a pool, so still and transparently clear that I put my foot in it before I saw the water. Round the edge lay huge sea-shells, used by the fishermen to fill their water-skins. The water was sweet, and perhaps its reputation of causing the consumer to swell was given it to prevent its too free use. Next day, following up

* *Conf.* the Hamitic "Kudab oro," "many children," and the "Banāl Mukbud," "daughters of Mukbud," name of the mass of hills round the Mukbud Peak.

the ravine, we mounted a dry waterfall, and found an incredible number of small shafts, stone huts, and quartz burrows. They reached back to opposite the Roman station we had seen. Here again were the evidences of two mining epochs, just as at Sighdit.

In computing the number of people who may have occupied these villages, it is probably right to consider all the huts to have been occupied at the same time. With many Oriental towns this is not the case. At Isfahan, for instance, there is always—speaking from memory—half the town deserted. Were Isfahan destroyed, and its people counted by houses, the estimate would be double the truth. But a miner would hardly build two houses, and there may well have been two thousand of the pre-Ptolemaic miners here. In the following afternoon we rode down to where the Imbarak entered the sea. We were in search of the Ptolemaic port *νεχέσια*. The stony slope is here so difficult for the camel's feet that progress could only be along the devious paths; so we went the way the path took us, and reached the flat unsmiling sea in the evening. Nothing was found that could



suggest an ancient port. But the moving sand along the coast covers everything, as at Berenice. The stony slope between the hills and the sea is, in this latitude, cruel work for the camels.

Covered with sharp blocks and scored with steep ravines it is difficult to go anywhere but up or down a wadi. However, we struck across and reached the Wadi Mukeyaj. Presently we entered the hills. Abu Tiur, where our camp was waiting for us, was always visible, a fine landmark seen at sea from a distance of 70 miles. But once in the hills we puzzled about a great deal before we could find a valley which led there, so difficult is it, on the eastern flank of the hills where the valleys are deeply scored, to go anywhere but where the wadies lead. Abu Tiur and the Saba'i hills stand up among their vertical schist surroundings tall bosses of buff-coloured live granite. A section near Abu Tiur is curious, the dip of the slate looking as if that mountain had dropped from above instead of risen from below.

A gaunt camel grazing by the way glared at us with deepest malignity. It was he who carried the heavy provision boxes, so their arrival was assured. We were now near Kosair, and near the well which supplied

Kosair with from one hundred to one hundred and fifty camel loads of water per day. Hendosa is the name of the well, a name also of a rounded granite rock near Um Eleigha.

The water is collected in a narrow ravine, and ponded under the sand by dykes of green hornblende.

During most of the night some five hundred water-skins are filled and laid on their backs in rows, like fat black pigs. No tap or syphon is used, but there is a tin "dipper" and a broad-mouthed tin funnel black with grease. It seemed right to admit 2 cubic feet of water per skin and estimate the daily yield of water at 14 tons, or 3000 gallons. The Hendosa wells are in the side of a great depression in the coast-line. In the centre of the depression is limestone over sandstone. Here runs the Khor Ambagi, of which the water is salt, and in the great Wadi Dibba' are tamarisk bushes, the sure accompaniment of limestone. Kosair, the λευκος διμην or white port, may have been an arm of the sea, like the Wadi Araba, but shorter and broader. It was pleasant to arrive at the civilised port of Kosair, fix the plane-table for the last time, and dine with the excellent governor. The road from Kosair to Kos is well known; indeed, it is now marked out in kilometres with red paint by Mr. Nicour, engineer-in-chief of the State railways in Egypt, and may some day have a train thundering through its narrow gorges of varied breccia and metamorphic rock.

In conclusion, the geographical results of this expedition are set forth in the map given on p. 480, and but little need be added to the concise legend. The surveys extend over 23,000 square miles of mountainous desert traversed by a ridge, the higher peaks of which shelter a few poorly-nourished shepherds, and the new map joins on the south the country described in the *Proceedings* of this Society for November, 1887.

The interest in the country is more geological and antiquarian than geographical. The numerous mines have been worked from the beginning of history, and by methods which were described two thousand years ago as of "the greatest antiquity." But geographically the country may be summed up in the following words:—

The broad sandstone plain slopes gently upwards from the Nile to a ridge running north-west and south-east, and varying from 2000 to 7000 feet in height, and to the east of the watershed slopes more steeply down to the sea. The valleys in and near the foot of the hills contain a fairly thick growth of acacias, on which sheep are fed. The water-supply is principally in natural reservoirs of rain-water. The principal feature is the mountain mass, under which lay the town of Berenice. These mountains, which run up to 7000 feet, are of porphyry and compact granite, and show signs of recent volcanic activity.

Ibex are numerous, the wild ass is still found, and the last ostrich

was ridden down not more than twenty years ago; but the camel will soon be undisputed lord of all the deserts. Here is clearly marked the footstep of the camel in his migration westward from Asia. History even allows us to fix the date when it was planted here. And the intimate connection which exists among his pastoral masters, between botany and geography, enables us to estimate the effect of the camel's arrival here.

THE ORTHOGRAPHY OF GEOGRAPHICAL NAMES.*

By Lieut.-Colonel J. C. DALTON, R.A.

To all who are interested in the vexed question of the orthography and pronunciation of geographical names, this interesting contribution will be welcome. The subject is one which is perhaps not so freely taken up as its importance to geographers and cartographers deserves, and we must be all the more grateful to those who, like Dr. Köppen, have devoted their attention to it, and who give to the geographical student the benefit of their knowledge and study in this direction. The pamphlet under review consists of some thirty-nine pages of closely-printed matter, and is in fact a paper laid before the German "Geographentag" (April 1893) by the author.

Though a complete translation would be very interesting, I have limited myself to a fairly full *précis*, owing to the imperative necessity for economising space.

The author divides his article into five main headings, which I propose to give in succession with as much brevity as I feel justified in using:—

1. *The development of the question since* 1885.—After pointing out the inconvenience of having several ways of writing geographical names, the author assigns the credit to the Royal Geographical Society of London and the British Admiralty for having, in 1885, been the first to attempt to grapple with the question, remarking that the English system of considering the "vowels as in Italian and the consonants as in English" is nearly identical with the principle followed in 1876 by the German Eastern Asiatic Company, who, on their part, had taken their ideas from 'Hepburn's Japanese-English Dictionary.'

In April, 1886, the Paris Geographical Society followed with rules which in many points agreed with the English, but which, unfortunately, have not found much support amongst French writers. However, in June, 1887, the French Admiralty accepted this system, and in 1888 the German Hydrographical Department published similar rules. The German "Geographentag" entered this subject on the programme for their meeting in Berlin in 1889, but hardly touched on it Though not ripe for discussion at the Berne Congress in 1891, it is hoped that it will be considered at the next assembly of this international Congress.

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* 'Die Schreibung Geographischer Namen: Vorschlag an den Deutschen Geographentag von 1893.' Von Professor Dr. W. Köppen. Hamburg 1893.

In the autumn of 1890 the Government of the United States assembled a "Board on Geographic Names,"* which consulted all the different foreign hydrographic departments, and published their answers in a voluminous report, dated October 7th, 1890. Dr. Köppen, in briefly criticising this system, agrees that, so far as the vowels are concerned, there can be no doubt that the (practically identical) German and Italian mode of writing them possesses the greatest advantages. But as regards the consonants it is otherwise; the dialectic differences in German are very great, and also through the absence of signs for the "soft" *s* and *sch* (French *z* and *j*), through the superfluity of two signs for the same sound in *f* (*v*) and *z* (*c*) (which latter, moreover, because it = *ts*, is really superfluous), and on account of the monstrous *sch*, the German consonant system is at a great disadvantage as compared with the French and English.

Through the above-mentioned decisions of the various hydrographical departments, official recognition has been obtained of a system analogous to that which certain prominent German geographers adopted some score or so years since. The author only regrets that in these later rules the principles followed by H. Kiepert in the fifties, and Von Richthofen in the seventies, have not been more fully made use of.

Kiepert's rules were, briefly, to employ the German vowel sounds *ä*, *ö*, *ü*, the English *y* for *j*, *v* for *w*, *kh* for *ch*, *s* for the sharp *s* (*sz*), *z* for a soft German *s*, *sh* for *sch*. Corresponding to the latter, *tsh* was written for the German *tsch* (English *ch*). A *j* denoted the French sound of this letter (soft *sch*). He objected to the English *zh*. Von Richthofen, in his work on China, also laid down rules for spelling the Chinese words.

The author gives a table which shows the decided similarity between the above systems and those more recent of London, Paris, and Berlin. He laments that the official systems are based on so slight a regard for the doctrine of sound and are so often wanting in clearness in their definitions; also the many different senses in which they use the words "hard" and "soft." Under these circumstances misunderstandings are unavoidable, and are even fostered by these systems.

He next investigates scientifically the various sounds as pronounced in different countries and in certain parts of Germany, and then formulates his proposals for an international (German, English, French) system of orthography for geographical names.

He bases his rules on the undermentioned principles or axioms:

A. That we admit without further alteration everything which is common to the three already-accepted systems of London, Paris, and Berlin.

B. That where the above three systems disagree we can, by disregarding the tendency in which they are formed, choose the best existing, which will ensure the utmost simplicity, economy, symmetry, and intelligibility. Thereby we shall preferably hold to the above-mentioned proposals of Kiepert and Von Richthofen.

C. That in some cases, which the above three systems have still left in doubt, we shall endeavour to amplify them in the same spirit.

The author then lays down rules under the above three headings, A, B, C.

A.—That which is already Agreed on and to be Accepted.

Rule 1.—*Names of countries (states and nations) in which Roman characters are officially used shall be written in the form in which they appear in the latest official publications (maps, books, &c.) of these states.*

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* The United States of America virtually accepted the system of the R.G.S. *en bloc.*

N.B.—This applies equally to the old Roman character and the alphabets derived from it, the German Gothic character, the Spanish *ñ*, &c. As regards colonies, "the orthography of a name in a territory belonging to a civilised power and given in their maps is only followed with respect to their own names and not to native names," which are transcribed according to sound. It is therefore all the more desirable that in the case of colonies and protectorates recently acquired, say, since 1880, the principle laid down in Rule 3 should be followed.

Rule 2.—*For names the orthography and pronunciation of which (in German, French, and English) is of long standing, such rendering shall be maintained in national publications without regard to the rendering which may be in force in the country itself. For example, in England we should still speak of* Copenhagen, Brussels, Cologne, *&c., and not of* Kjøbenhavn, Bruxelles, Köln, *&c. In publications bearing an international character such forms naturally fall to the ground.*

Rule 3.—*For all remaining names the true sound as used in the place itself, or in the official language of the state concerned, will determine the mode of orthography.*

Rule 4.—*An approximation, however, to the sound is all that can be aimed at, and not any exact representation of the minor shades of difference which would involve a far too complicated system of signs.*

N.B.—We may define the limits of exactness to be such as would sufficiently express the sound by means which exist in European languages.

Uniformity may be attained by understanding the sound-value of the following letters :—

a, *e*, *i*, *o*, *u*, pronounced as in German or Italian.

b, *d*, *f*, *k*, *l*, *m*, *n*, *p*, *r*, *t*, „ „ „ French, or English.

g „ as *g* before *a* and *u* in French and English.

v „ as in French and English.

y „ as a consonant, like the German *j*.

sh „ as in English (= German *sch*, French *ch*, Italian *sc*).

kh „ like the German and Scotch *ch*, Greek χ, Spanish *j* and *x*.

gh „ like the modern Greek γ, Dutch *g*, or North German *g* in "Lage."

ph is not to be used in the sense of *f*.

h, except where it is used to alter the pronunciation of a preceding consonant, will always be pronounced as in German and English; mute or aspirated *h* will not be used.

B.—As to those Points where the three Systems disagree and which require to be decided, we must try and find the best Solution.

Rule 5.—*In every case where it appears desirable, a second rendering of the name may be placed in brackets; thus all which bears on traditional orthography can be in large characters, and the exact phonetic rendering can be smaller. Thus, for example* Kiyef (*Kiew*), Chieti (*Kiéti*), Ceuta (*thé-uta*).

N.B.—As regards Rule 2, a similar course can be adopted if necessary. Ex. Milano (*Milan*), (*Ger. Mailand*).

Also with Russian names ending in *ov* and *ev* the rendering might be, for example, Tambôf (*Tambov*), Nikalàyefsk (*Nikolaevsk*).

Rule 6.—*All compound-sounds, such as* x, *the German* z *and* c, *the English* j *and* ch, *shall be separated into their constituent parts.*

N.B.—The association of sounds varies greatly in different languages; thus the combination *ts*, frequent in German, Russian, and Chinese, is not found in English and French. *Tsh* (German *tsch*) is frequent in English, Italian, and Russian, but rare in German and French. The symbols selected in different languages to denote these sounds vary. The common English compound sound *j* and Italian *gi* are wanting in French and Russian, although their constituents exist.

[The author here analyzes and tabulates the various sounds as they can be rendered by European tongues, specifying by figures those sounds which cannot be so rendered, and showing how the three (English, French, and German) systems of orthography provide for them. He shows that the English provide for seven, the French for five out of these seven, and the German only for one which is not provided for by the English or French.]

To fill the gaps he proposes his

Rule 7.—*Diacritical signs attached to letters are to be avoided, and only can be permitted* (*a*) *when sanctioned by many years usage in an important literature* (Ex. ö *and* ü *in German*); (*b*) *when, without them, the pronunciation would be not only less exact, but unrecognisable.*

Rule 8.—*In the case of names spelt according to sound, each letter must be distinctly pronounced, with the exception that two different vowels coming together may form a diphthong, and amongst consonants a few simple sounds will be represented by pairs of letters.*

N.B.—This rule corresponds to Rule 7 of the British system, in which, however, the consonants with *h* and the *ng* are omitted. Rules 1 to 4 correspond to the similar numbers in the British scheme. To complete the omissions in the three schemes, the author proposes a *th*, *dh*, *zh*, *ng* (as in "Lunge"), *ü*, and *ö*.

As regards accents, the English and German systems only admit one *acute* accent "where there is a very decided emphatic syllable which affects the sound of the word." The French do not mention such, but use a circumflex accent to *lengthen* a vowel. Doubling a vowel is not admitted except in special cases such as "Nuulua." To shorten a vowel the English system doubles the consonant which follows it, but the Germans do not legislate for either lengthening or shortening vowels. The German hydrographical rules use *ä* and *å* to denote the open *e* and *o*.

Rule 9.—*A grave accent should denote an accented open vowel, an acute accent an accented closed vowel, and a circumflex a vowel pronounced long* (*accented more or less*), *also a doubling of the consonant following a vowel will denote a pronounced short vowel; should there be any doubt as to the accent, then the vowel should be left unaccented.*

Examples of "wide" vowels are those as in Tisch, Tusch—to be written with *ì* and *ù* if the accent is on them.

C.—Points Left Untouched in the Three Systems.

(1) For the sound of the Russian и (Polish *y*, Roumanian *î* and *ă*) he recommends the symbol *ï*.

(2) For the nasal vowels (French sound *an*, *on*, *in*, *un*) he proposes the Portuguese equivalents *ã*, *õ*, *ẽ*, *ũ*.

(3) Palatal consonants: In order to obtain the *j* (*y*) sound, which in certain lan-

guages appear between a consonant and the vowel following in such words as *Rjasan*, *Dnjestr*, he introduces a *y*, and legislates for it as follows in

Rule 10.—*A* y *after a consonant is to be pronounced as if dissolved with it, and serves as an index of the palatal sound of the consonant. This is, however, indispensable before* a, o, u, *and* è; *in other cases it would be used when by so doing it would simplify the case.*

N.B.—This rule would mainly be used for transcribing Russian words.

A few examples out of those cited by the author will show how this rule would be applied.

French.—Gascogne (gaskòny), Bretagne (brötány).
Italian.—Bologna (bolònnya), Legnago (lenyágo).
Portuguese.—Minho = Spanish Miño (mínyo).
Russian.—Ryazán (ryazány), Tvér (tyvéry), Kharkof (kháryk'f).

Rule 11.—*When two letters, which denote, when joined together, a diphthong or a simple consonant sound, are pronounced separately, they should be joined together with a hyphen* (-). Example, *Da-urien.*

The author by means of a table compares the proposed international geographical alphabet with the "standard alphabet" of Lepsius and that described in the 'Maître Phonétique,' by P. Passy, with which it generally agrees.

The international alphabet as proposed by the author is as follows:—

p		*t*			*k*
b		*d*			*g*
f	*th*	*s*	*sh*		*kh*
v	*dh*	*z*	*zh*	(*j*)	*gh*
m		*n*			*ng*
w	*y*	*r*	*l*		*h*
	u	*ü*	*i*		
	ó	*ö*	*é*		
	ò	*ö*	*è*		
		a			
	ā	*ē*	*ō*	*ō̄*	
ky	*gy*	*ny*	*ly*		*khy* (*χ*)
á	*ê*	*í*	*ó*		*ú*

Having now arrived at the international alphabet, the production of which was aimed at, the author proposes the 12th and last rule.

Rule 12.—*For purposes of transcription, speaking generally, it is necessary that each sound shall be expressed by the letter which most closely represents it, without regard to grammar, derivation of words, and the traditional orthography in the language immediately concerned.*

The above paper was completed in May 1892 and laid before the committee appointed by the German Kolonialrath to draw up a system for the pronunciation and orthography of geographical names in the German protectorates, which resulted in the rules (approved and adopted by the German Government) to which attention was drawn in the *Proceedings* R.G.S. of November, 1892.

The orthography as then adopted would, if arranged in a table similar to that given above (proposed by Dr. Köppen), be as follows—

p		*t*		*k*
b		*d*		*g*
f	—	*s̈*	*sh*	*kh*
v	—	*f*	*j*	*gh*
m		*n*		—
w	*y*	*r*	*l*	*h*

u	*ũ*	—	*i*	
o	*õ*	*e*		
o	*ö*	*ä*		
	a			
—	—	—	—	
—	—	—	—	—
â	*ê*	*î*	*ô*	*û*

Dr. Köppen claims that a glance at the two tables will show that in most cases the committee agreed with his proposals; and he indicates and criticises those points as to which the committee did not accept his views (these are shown by the blanks in the latter of the two tables).

In a footnote, p. 35, Dr. Köppen alludes to the *Proceedings* R.G.S. of November last, wherein I reviewed the new German rules and compared them with those brought out in 1885 by the R.G.S. (and revised in 1892).

Though I cannot but feel honoured that my few humble criticisms of the points of difference between the English and German systems should have been deemed worthy of the attention of so distinguished an authority as Professor Köppen, I regret that they have left such a poor impression on him as his remarks in the above-mentioned footnote would seem to imply.

Still, may it not be possible that we are considering the subject of orthography of geographical names from different standpoints? The English system as drawn up by the R.G.S. was a system of "orthography for native names of places," and, strictly speaking, its object was to secure uniformity in spelling the names of outlandish places in our various colonies and elsewhere, of which the languages are legion and complicated. For that reason our two first rules especially lay down that no change is made in the spelling of foreign names in countries which use Roman characters, nor is any change made in the spelling of such names not written in Roman character, but which from long usage have become familiar to English readers.

Our rules, in fact, like the new German rules, are for our protectorates or *Schutzgebieten*. Therefore it is undoubtedly important that as the English and German protectorates are in many cases conterminous,

the orthographical rules of the two countries should be as nearly identical as possible. The principal value of such rules is for purposes of official correspondence, and above all for hydrographical sailing directions, and charts, and for maps. As one who for several years has had to do with map compilation, I naturally look to such rules from the point of view of the cartographer, and unhesitatingly maintain that any system of spelling which contains the quantity of diacritical signs, and arrangements of letters as does Dr. Köppen's, defeats itself and becomes impossible for the cartographer, or in fact for any *practical* use.

Dr. Köppen has produced with infinite study and care a system for an international rendering of geographical names, as near perfection as such a system could probably be got; but in order to embody every possible sound which can be thought of it has necessarily become complicated, and is a language of itself. It is far more extensive than are the English and French rules, in which simplicity and avoidance of diacritical signs is the key-note. It deals with *all* geographical names; ours and the new German system only deal with native place-names.

The subject is, however, of such importance that, as Dr. Köppen says, it is sincerely to be hoped that the next international geographical congress will deal with it. If a small international committee of English, American, French, and German experts were appointed to thrash out the question, it must result in good; and the valuable paper by Dr. Köppen, of which I have only been able to give a *précis*, and which deserves to be read in its entirety, could not fail to be of the greatest assistance to such a committee.

THE ACROPOLIS OF SUSA.*

By Major-General Sir FREDERIC GOLDSMID, K.C.S.I., C.B.

FAVOURED by the patronage and support of the French Government, M. Marcel Dieulafoy has, under the above title, produced a handsome and remarkable volume treating of the contents of mounds in south-western Persia, to which the attention of Biblical students has been especially drawn during the second half of the fast-closing century, though by no means ignored by earlier travellers and explorers. But the result of systematic excavations, carried on within the last decade of years, has a more cosmopolitan significance than is exemplified in substantial relics and valuable additions to the thesaurus of the Louvre. It is further notably displayed in the ventilation and propagation of archæological and ethnological theories, which, if they do not always

* 'L'Acropole de Suse; d'après les Fouilles exécutées en 1884, 1885, 1886.' Sous es auspices du Musée du Louvre. Paris, Hachette, 1893.

command the assent, cannot fail to invoke the interest of all seekers after historical truth. For the better prosecution of objects such as these the author has availed himself of the services of a learned member of his mission, M. F. Houssay, from whose separate work, 'Les Races humaines de la Perse,' he has extracted the more pertinent and appropriate passages.

The book, although bearing the date of the current year, is not in all respects a new one. It is referred to by Mr. Curzon * under its present title as published in 1890; but as the work appeared in instalments, the allusion can only apply to a part of the later and complete issue. Nor must this particular issue be confounded with the author's former publication, 'L'Art antique de la Perse,' which, together with the writings of his accomplished partner and fellow-traveller, Madame Jane Dieulafoy, has long enriched the bibliography of the Shah's dominions. In 'La Perse, la Chaldée, et la Susiane,' the title given to this lady's clever and attractive papers in the *Tour du Monde*, we are manifestly brought to the very threshold of the more solid 'Acropole de Suse.' All honour to our neighbours across the Channel, that whatever changes of government occur among them, in men or in form, whether the treasury be in the hands of imperial, monarchical, or republican keepers, and despite of the ever-existing necessity to equip fleets and armies, and keep up the paraphernalia of State to the full extent, the æsthetic is not swamped in the practical idea, nor is money grudged for the cause of science and scientific research. In England we give encouragement to this kind of thing when it suits our convenience, or entails no demand upon the public purse; but the cost of execution is met by individuals and societies. No better illustration of the case on either side could be furnished than by contrasting the modest octavo of 'Travels and Researches in Chaldea and Susiana,' by Loftus (Nisbet, 1857) with the magnificent French quarto now under notice (Hachette, 1893), with its three hundred and eighty-six engravings, to say nothing of elaborate plans and maps. Loftus, it is true, was attached for the nonce to a Boundary Commission, so that his work of scientific exploration could take shelter under a quasi-political ægis; but Dieulafoy had a special mission of his own, with certainty of aid, if required, from the Republican Government and the local authorities.

'L'Acropole de Suse' consists of twenty-five chapters, of which the first three are introductory to the story of the excavations. But they are of equal importance with the rest of the book, and will possibly command a greater share of attention. No. I., headed "Geographie Physique de l'Anzan-Sousounka," gives its full signification to a compound name which at first sight will only be recognised by those who have some knowledge of the literature of the Cuneiform. Nos. II. and

* 'Persia and the Persian Question,' vol. ii. p. 309.

III. are speculative historical treatises, to which is appended a summary of M. Houssay's ethnographical results. The outcome of local research is then shown under three main heads: "Fortification," to which five chapters are assigned; "Faïences" (comprising crockery, pottery, terra-cotta, and ornamental or decorative finds of sorts), which claim two chapters; and "l'Apadana and Ayadana." The last are the ancient designations of the Hall of the Throne and Fire Sanctuary, the original construction of which, and proposed reconstruction for present intelligibility, are questions elaborately treated in the five chapters that complete the volume. As it would be difficult to reproduce the several arguments used in support of theories advanced, and otherwise do justice to the conscientious labour displayed in these pages by a summarised analysis of their contents, we confine ourselves to a glance at some of the more striking features presented in them.

First, as to the identification of Susiana, the modern Khuzistan, with the "Anzan-Sousounka" of M. Dieulafoy. The question is one which should concern geographers; for although the word "Khuzistan" has, for administrative purposes, been superseded by the vague and pretentious "Arabistan," it is by the former only that we connect the province with the classical periods and remoter antiquity. About twelve or thirteen years ago Sir Henry Rawlinson deciphered for the benefit of a small audience at the Royal Asiatic Society's rooms in Albemarle Street, an inscription on a newly-discovered cylinder of Cyrus the Great. The monarch described himself, "son of Cambyses, the great king, King of the city of *Ansan*," and the interpretation given to a till then unknown name was that it must refer to a part of Elam or its immediate neighbourhood. In favour of this view was alleged "the frequent junction of the name, especially in the astrological tablets, with *Subartu*, . . . a well-known title for the portion of Susiana which adjoins the mountains." But in a postscript to his published paper on the subject, Sir Henry stated that, since his notes had been in type, he had observed that Professor Sayce had already proposed to identify the word romanised into *Ansan* with a certain *Anzana*, which he claimed "to have found in the inscriptions of Susa and Elymaïs, as the native name of those countries, the common title of the Susian king being, according to this reading, 'Lord of the Empire of *Anzan*.'"* Somewhat later Professor Nöldeke, referring to the cylinder and a newly-discovered Babylonian tablet on which also the name *Anshan* (*sic*) appears, in connection with Cyrus, wrote: "*Anshan* has been looked for, without sufficient grounds, in the direction of Susiana. Even if it be true that *Anshan*, written as here in two ways, elsewhere means Susiana—

* *Journal of Royal Asiatic Society*. New Series. Vol. xii., Part I. (January 1880). See also, later in the same year, paper "On a Cuneiform Inscription relating to the capture of Babylon by Cyrus," in *Transactions* of the Society of Biblical Archæology.

and this Oppert emphatically denies—we should still have to regard this only as a Babylonian inexactitude of expression. It is far more likely that *Anshan* was a place in Persis, the proper family seat of the Achæmenides, therefore perhaps near Pasargadae, or identified with it." *

Now let us turn to M. Dieulafoy, who seems to have satisfied himself on the subject, and has taken infinite pains to make his treatment of it exhaustive. Nothing daunted by time or change, he rushes to the *fons et origo* of his history, reverts to the early Biblical period, finds his starting-point in that wonderful tenth chapter of Genesis (so commonly passed over as one of names only), and boldly traces the fortunes of Elam, from the days of the son of Shem, to those of the Muhammadan Khalifs, a period roughly computable at three thousand years. Though this is no place in which to follow him, step by step, through his laborious investigations, we may state that, to achieve his purpose, he consults the ethnography of Persia generally, and its special developments in the south-west; the sculptures and inscriptions which come in his way, whether at Bésitún, Malamír, Mashhadi-Murghâb, Nakshai-Rustam, or Bushire; the classical authorities, such as Herodotus, Diodorus Siculus, Strabo, Quintus Curtius, Arrian, and others to whom even the more modern inquirers are so much indebted for light; as also the learned readings of Oppert and the better known interpreters of Cuneiform. Admitting the intervention of many and important gaps, together with long periods (even consecutive centuries) of doubt and obscurity, he finds that a certain Koudour Nakhounta (*sic*), King of Elam, is the first Susian potentate of whom any trace is obtainable; that, according to an inscription of Achchour (Assur) banipal he flourished in B.C. 2295; and that, having subdued Chaldæa, he founded the kingdom of Anzan-Sousounka. He was a predecessor, on the throne of Elam, of Koudour Lagomer (the Chedorlaomer of our English Bible), one of the four kings from whose hands the patriarch Abraham rescued his nephew Lot. Holy Scripture gives the date of this incident at circa B.C. 1913. Singularly enough the second Koudour Nakhounta does not appear in M. Dieulafoy's narrative until B.C. 693,† or sixteen centuries after the first; though we can hardly suppose that "Koudour Nakhounta II." is a strictly correct designation.

Our author adds that this Anzan-Sousounka, when consolidated as an independent monarchy, or up to the period of its conquest by Assyria in the seventh century B.C., comprised the south of Ardelan, Luristan, Arabistan, the Bakhtiári Mountains, and the north-eastern shores of the Persian Gulf—practically, the larger portion of Western

* 'Encyclopædia Britannica.' Ninth edition. Vol. xviii. (1885), p. 565.

† 'Chronique Babylonienne d'Arrabeltakkit' (Oppert's version). Mém. Paris Institut, 1887.

Persia between 26° and 35° parallels of latitude. The whole territory was divided into two governments, *i.e.*, Susiana or the plains, including the littoral of the gulf, and Anzan or the mountain ranges. Khuzistan would naturally fall into the former division. Not the least instructive result of his inquiries is the statement put forward in reference to the negro element in the population of Persia. His assertion that the plains and maritime parts of Susiana have been peopled by "Negritos," full and half-bred, will no doubt be attested by the ordinary traveller as well as ethnographer. These are not, he holds, the "Kushite" immigrants, traced by M. Eckstein and other writers from the southern slopes of the Hindu Kush, who, moving along the shores of Western India, had crossed over to the Persian Gulf, Susiana and Chaldæa, and reached the African Nile; nor is the so-called "Negrito" to be confounded with the real African negro.

It is presumed, then, that, for adaptation to modern times, and therefore illustratively rather than philologically, we may define Anzan-Sousounka, as Elam, or more strictly Elymaïs-Susiana. The second word belongs to the Sousa of Herodotus and Susis of Strabo, and has palpable affinity with the Scriptural Shushan and the now discussed and still more ancient Sousanka, while it is again to be traced in the "Susanechæi" of the scribe and priest Ezra, whom M. Dieulafoy, according to the division of the books in the Latin Vulgate, calls Esdras.

As to the name *Khuzistan*, we are told, on the evidence of the inscriptions, that among the inhabitants of Anzan-Sousounka were four divisions of people known as Houssi, Habardib, or Hapartip (very suggestive of Sanskrit in its last syllable), Koussí, and Nímê. In the first and third, the common Indo-Persian termination, *stan*, would suffice to give almost the exact etymology required. M. Dieulafoy thus comments upon them, noting Oppert's authority: "Dans Houssi ou Khoussi on reconnait la racine locale du nom—Uxie—attribué par les Grecs à l'extrême sud de la chaine des monts Zagros séparative de la Suside et de la vieille Perse, puis la racine d'Uwaja, Khouz et Khouzistan, expressions géographiques dont se servaient les Perses du moyen âge pour designer l'Arabistan moderne."

In Curzon's 'Persia,' vol. ii. p. 320, is the following footnote: "Khuzistan is thought to be derived from the word Uwaja signifying aborigines, that occurs in the Cuneiform inscriptions, and is, perhaps, also the origin of the Uxii of Strabo and Pliny. On the other hand Mordtmann derives Khuzistan from a Persian word meaning sugar-cane."

To the above extracts may be added one from a curious, well-printed Elzevir duodecimo of 1633,* which states: "juxta mare *Abadan* .... sita est terra *Chusistan* (nomen habens à Cossæis latronibus, quorum Plinius

* 'Persia seu Regni Persici status.' By John de Laet, s.d. (Leyden).

meminit liber vi., cap. 27) ad quam pertinet *Ahvaz* et *Escar Mekrom* et *Gendi Sabur*, et *Susa* et *Ram Hormoz*." All these places now remain, or are capable of identification; but the derivation from the Cossæi looks unlikely. From the same little book we gather the historical fact mentioned by "Shikardus" (Schickard, *ob.* 1635) that in the twenty-first year of the Hijira, or about A.D. 642, one Mûsa Askari, despatched with an army east of the Tigris, occupied Khuzistan, with the two cities of Ahwaz and Susa.

Another question of geographical interest is that of identification of rivers in the immediate neighbourhood of Susa and the Memnonium. The four to which M. Dieulafoy gives the first consideration are: (1) the Choaspes, or Kerkha, an affluent of the Tigris; (2) the Ulái or Eulœus, which connected the Choaspes and Koprates; (3) the Koprates or Abi-Dizful, coming down, like the Kerkha, from the mountains of Luristan; and (4) the Pasitigris or Karun, which received the waters of the Koprates, increased by those of the Choaspes passing through the Ulái. For the second he finds no corresponding modern name, because he cannot accept the "ruisseau, le Chaour"—according to Loftus "a narrow stream" quite unsuited for identification with the waters on which Alexander sailed from Susa to the sea—to represent the river which, as we have the highest authority for believing, laved the walls of the Memnonium. But he has no objection to offer to the compromise by which Loftus accords to the "ruisseau" the honour of absorption into an artificial channel formed by a bifurcation of the Kerkha at some distance above Susa, corresponding with Ptolemy's "left branch of the Eulœus" on which the city is built. Captain Wells, it is true, visiting the locality in 1881, "could see no sign of the depression in which Loftus would have one believe the Eulœus once flowed."* This, however, is but the note of a passing traveller; whereas Dieulafoy, a repeated visitor and sojourner at Susa, wrote: "L'Oulai, aujourd'hui comblé, mais apparent sur son ancien parcours"—and so affirmed that the bed, though dry, was *en évidence*. Later on, the view which he entertains of his English predecessor's disposal of the whole question is stated in strong terms, and merits quotation: "La détermination du cours de l'Oulai pouvait seule présenter quelques difficultés; mais le problème, très bien posé par Loftus, a été résolu d'une manière décisive."

In the following extract from M. Dieulafoy's introductory chapters, it is not quite clear to what particular point in "the high table-lands of Susiana," he refers. The southern road appears to be the natural and more direct one to reach Fars viâ Bebehan. With regard to the route indicated as that of MM. Babin and Houssaye, Colonel Wells, R.E., marched from Ahwaz (west of Ram Hormuz) to Shiraz in fifteen days

* *Proceedings of Royal Geographical Society*, Vol. V., New Series (March, 1883), p. 155.

of December, 1881. The italics are in accordance with the original text:—

"The best map is misleading when consulted for information which it is unable to supply, such as the estimation, in stages, of a road to be traversed. The passage of the Zagros Mountains from Persepolis to Malamir is a long and painful military operation during the fine season, and impracticable in winter, although the actual wall scarcely attains in theoretical breadth 200 kilomètres. It has been indeed demonstrated from the information given by the caravan leaders—or, better still, reported by MM. Babin and Houssaye, in connection with their journey to Malamir, Ram Hormuz, and Shiraz—that *it is impossible to proceed directly from the high table-lands of Susiana into Fars.* It would be necessary either to move up again northward and reach Media, or to come down again southward and debouch by the Persian Pylœ. The journey by caravan, if the more direct road were chosen, would be from thirty-five to forty days in the fine season; while in winter the road is always covered with snow."

By the Persian Pylœ may be intended the *Pylæ Susidæ*, which Quintus Curtius refers to as the scene of dangers and difficulties for Alexander and his troops. But the position would be better understood with a more practical illustration.

Space is wanting to enter more fully into the merits of this remarkable publication, so creditable to the ability and industry of the author. We may not even venture into the domain of practical research, or speak of the excavations carried out, and their successful results; but our readers may be assured there is much in these things to fascinate and instruct. The volume is one which should find a conspicuous place in all high-class libraries and institutions.

In taking leave of M. Dieulafoy one brief extract may be appropriate, showing how, with the Arab invasion, the curtain falls on the history which he has sketched out with so much care as an introduction to the story of the disentombed Acropolis.

"Then came the Arab hordes. They disembarked at Muhamra, moved up the Karun, reached Shuster and Susa. At this period (A.D. 640) the legend of Daniel's tomb took shape, and the first funereal edifices or cenotaphs consecrated to the great prophet were reared. The Jews assembled in multitudes, as proved by research; then the desert, that inseparable companion of Islam, spread itself around the Sassanian cities, erst so populous, and over the lands erst so fertile. Ahwáz, Muhamra, Hawízeh, Susa, Aiwan, Júndi Shápúr disappeared for ever; the latest Arab monuments yet indicative of living civilisation belong to the eleventh and twelfth centuries. Dizful and Shuster, raised from the ruins of Susa and peopled by its last inhabitants, alone outlived, wretched and devastated, this era of desolation. At the present day tribes but rarely traverse the Steppe, and these wonderful lands, where millions

could find a facile and plenteous subsistence, do not sustain 100,000 inhabitants. As for Susa, the mother of cities, she is reduced to a few ravined peaks covered with herbs and brambles in winter—dry, when the implacable sun burns the growing grass. How many centuries of glories and troubles, how many kingdoms repose under this accumulation of dust!"

A FRENCH ARCHITECT IN INDIA.*

By W. M. CONWAY.

In days not so very far removed from our own a man who had been to Rome was considered a great traveller. It is now easy to go round the world and to visit many of the most remote countries without transgressing the limits of touristdom, nor can one any longer readily define what it is that divides the tourist from the traveller. The essential qualities upon which the distinction depends belong rather to an attitude of mind than to a manner of moving about. George Borrow, crossing England in a railway train, was a traveller because he looked out of his head with a traveller's eyes. Most globe-trotters survey all countries in an unobservant, touristical fashion, and return from the farthest parts of the Earth without having experienced one of the emotions that the intelligent can derive from a walk in Surrey.

Our great dependency, India, which is becoming more and more the playground of the tourist, is a country abounding in interest for every intelligent traveller. It is not my purpose here to discuss all the diverse matters of interest that are ready to appeal to an intelligent eye, but to treat briefly a small group of them, and to point out how far a recently published work, issued under the auspices of the French Minister of Public Instruction, and lately added to the library of the Society, is worth the attention of intending travellers.

A difficulty, which I myself experienced on the occasion of a first visit to India, and which has doubtless been felt by many, is that of deciding what to see. In all countries called "old," the most noteworthy sights, after the living folk, are the architectural monuments of all ages. The man who has not been to India knows in a general way that it is very large, very various, the home of many races, the site of many ancient civilisations, and that it is dotted over with countless monuments. Which of all these should be visited? That is the problem that faces the intelligent traveller If he sets to work to read up the subject, he embarks upon a wearisome and almost hopeless task. Fergusson, as an architectural critic, is far from reliable; as an art-historian is too much given to "believing" and having this and the

* 'Les Monuments de l'Inde,' by Dr. Gustave Le Bon, Paris, 1893.

other "guess" and "impression," where what the student wants is facts; as a mythologist he sees trees and serpents everywhere; and finally, as a writer, he is not, to say the least of it, invariably interesting. Moreover, the illustration of his book leaves much to be desired. If the student in his thoroughness proceeds to a lower stratum of research and burrows into the archæological publications of the Indian Government, he enters upon about as forlorn an undertaking as the imagination can picture. When therefore there appeared, in all the sumptuousness of a quarto volume, published by the Librarie de Firmin-Didot et Cie. Dr. Gustave Le Bon's work entitled 'Les Monuments de l'Inde,' we were not without hope that here at last French clearness of exposition and excellence of illustration had stepped in and accomplished what our own countrymen ought to have done for us long ago. A detailed study of this imposing work has not been so satisfactory in its results as one might have wished. The book has its merits; it has also grave defects. A brief and impartial statement of the one and the other may not be without a measure of utility.

Dr. Le Bon was sent out to India by the French Government with official credentials and a government subsidy. But, despite the pretensions of the opening chapters, his book is not an important contribution to the literature of the subject. With regard to English action in respect of antiquities, Dr. Le Bon shows some unfairness and prejudice. The only ancient monuments to which, he says, we pay the least attention, are those in Agra, Delhi, and the large towns; and this notwithstanding the fact that he himself photographed the Sanchi Tope in the really admirable state of preservation in which it is now maintained. He describes the vandalism at Gwalior as though it were still in progress, whereas the fact is that the damage done there was trifling, and the care now bestowed upon the antiquities of the citadel is more than could anywhere be paralleled in Algeria, where, for instance, at Tlemçen exquisite Moorish buildings are still mutilated by the local authorities. This is to be regretted, not because Dr. Le Bon's strictures are in themselves injurious, but because there is much still to be done in the matter of monument preservation by the Indian Government, and the suggestions of a wise foreign critic, who did not put himself out of court by his own evident lack of impartiality, would have been helpful to those in England and India who are anxious to see these matters thoroughly attended to by the authorities.

Beyond the photographs, there is little new in the book. In the case of the most ancient monuments, Dr. Le Bon is content to give a date without stating reasons or quoting authorities, and the dates given are, in many cases, by no means universally agreed upon by students. There is throughout a general lack of references to the literature of his subject, and his whole method is unscholarly.

Nor can Dr. Le Bon's judgments as an art critic command our assent.

He overpraises many things. The old residence of the Gwalior princes he describes as "a magic palace entirely encrusted with precious stones." The badly proportioned tomb of Etmad-ud-doulah, at Agra, a piece of marble confectionery, he considers about the finest work of the Mogul period. The decorative carvings at Sanchi, are, he says, as fine as "belles oeuvres dues au ciseau grec." A multitude of similar instances of false perception might be quoted.

Again, Dr. Le Bon complains that English writers call the style of the early Mussulman architecture of old Delhi Pathan, which it is; and then he goes on to say that this style does not differ from *that of the Arabs* except by some Hindu additions. As a matter of fact, the Arabs have not, and never have had, any style of architecture at all. The architecture of the various countries that have at different times embraced Islam arose out of Hellenistic, Byzantine, and Mesopotamian traditions, and contained no Arab element whatever.

There is only one satisfactory arrangement for a book of this kind, and that is the chronological. Art is a thing that develops, decays, becomes transformed, develops and decays again, and so forth. It is also influenced by locality and race; but time is the main factor within broad limits of area. There are certain great epochs of Indian as of European art. These the local arrangement chosen by Dr. Le Bon for the most part sets at nought. Two such closely-allied buildings as the Kutub and Ajmir mosques are widely separated in his pages. The reader is forced by him to hop about in the giddiest fashion amongst the centuries. This is all the more to be regretted because the admirable sketch which in one place he gives of the development of Mussulman architecture in India shows how interestingly he might have written had he adopted a sounder method.

In the present state of our knowledge it is the earliest known period of Indian art, when in the wake of Alexander's inroad and under the influence of the Greco-Bactrian kingdom the influence of Hellenistic art penetrated into the Panjab, that is of most interest to the European student. Before that time there were doubtless plenty of fine wooden buildings, sculptures in wood, rich woven stuffs, and other artistic products (though Dr. Le Bon seems to suppose that this was not suspected); but, a few excavated holes in Behar notwithstanding, there appears to have been neither architecture nor sculpture in stone. It was owing to Hellenistic influence coming doubtless through Persia and infected by Persia, that India was led to take this important step in art. The transforming power of India upon all manner of civilising influences certainly is and always has been great. It made both Greek and Persian forms disappear, but none the less did it receive an influence from the far-off Ægean, without which the history of architecture in India would not have been what it was. That Hellenistic influence was not communicated by a single impulse, but came as it were in

waves, has been amply proved by Mr. Vincent A. Smith in the Journal of the Asiatic Society of Bengal for the year 1889.

Existing bas-reliefs of the Gandhara school provide ample materials for the reconstruction of some semblance of the buildings in wood and crude brick, which were imitated by the earliest stone builders in India. The characteristic Venetian windows of the thirteenth and fourteenth centuries, those grouped under the "second order" by Mr. Ruskin in 'Stones of Venice,' were closely copied from Indian arches such as are depicted on the old Gandhara bas-reliefs; and the Indian originals were themselves merely translations into stone of the form assumed by the gable end of a mud-built chamber, roofed with thatch. This fact, which I believe has not before been noticed, is worth recollection. It is to be hoped that some one will soon be found to bring together the considerable body of existing materials for the reconstruction of the early architecture of India, and thus to earn the gratitude of all students of the general history of art.

When we come down to later periods, our author is still frequently at fault. With reference to the Kutub Tower of Victory, which is not a minaret in the usual sense, a reference to Fergusson would have told him that there are earlier towers in the Ghazni country of the same type, from which it was obviously imitated; but then this would have militated against his opinion that there is nothing Pathan in the architecture of Old Delhi.

We should not have noticed the omission of ground plans of the buildings visited, did not Dr. Le Bon claim for that omission a kind of virtue.

I have now done with my strictures upon M. Le Bon's work, and warned the reader against what he will find of insufficiency in his treatment of his great subject. It remains only to point out the considerable utility which yet abides in this very attractive volume. The four hundred prints either processed or engraved from the author's negatives (with a few additions from other sources) form an invaluable collection of illustrative materials which will be of great interest to people of divergent tastes. Many of the plates, notably those taken in Nepal, are of buildings never photographed before. As a whole they form a series that illustrates the development of architecture in India in a fairly complete manner. It is unfortunate that Kashmir and Ceylon are both left out, but we must be grateful for what is included. With this book in his hand the intelligent traveller can before leaving home make his selection of things to be seen. It is not a complete collection, but, as far as it goes, it is of great value. England ought not to have been dependent for it on the enterprise of a Frenchman, and a subsidy from the tax-payers of France. If we could hope that the existence of this book might stir up English students to put an end to the present chaotic amateurishness of their writings about Indian archæology, we should welcome it even more warmly than we do.

THE UNIVERSAL ATLAS.*

With the issue of Part 28 this atlas, which was commenced in 1891, is complete. It is an English edition of Dr. Andree's well-known Handatlas, which created such a favourable impression when it first appeared in 1880, with the addition of maps, on enlarged scales, of England, Scotland, Canada, Australia, the Indian Frontier, and the Trade of the British Empire; together with others scarcely less important. It has been produced entirely for the use of English readers, the maps of the German edition having been added to, and corrected, so as to include in them the latest results of geographical research up to the date of publication. The work of transliteration has been carried out in a very satisfactory manner by Mr. W. J. Turner; but in a work of such magnitude, including 125,000 names, it can hardly be expected but that some oversights will occur. These, however, are unimportant, and few in number.

Considering the low price (£1 10s.) it is the best atlas, for the money, that has ever been published in this country. In saying this it is not intended to convey the idea that it is to be compared with the more expensive atlases in the market, such for instance as the new edition of W. and A. K. Johnston's Royal Atlas. Nor as regards the artistic merit of the maps, does it equal Stieler's Hand Atlas, and, indeed, considering the great difference of price, it could hardly be supposed that it would. It is, however, in all respects a thoroughly good and useful work, and as special attention has been given to the maps of the British Empire, it is far better suited to English readers for the purpose of reference than any of the more pretentious atlases published on the Continent.

Some idea may be formed of the estimation in which Dr. Andree's Atlas is held on the Continent, from the fact that as far back as 1891, no less than two hundred thousand copies had been sold in Germany alone, and that at the present time, a third edition is in course of publication, and special editions, which have been published in *other* countries, have met with a favourable reception. The enterprise of German map publishers will be better understood when it is known that the production of the first edition cost £50,000. The index with which this atlas is furnished has been most carefully prepared, and is a most valuable addition to the original work, which was without one.

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* The Universal Atlas. Published by Cassell & Co., London, for the Atlas Publishing Company.

CAPTAIN BIA'S EXPLORATIONS IN THE SOUTH-EASTERN CONGO BASIN.*

Le Mouvement Géographique publishes letters from Lieuts. Francqui and Derscheid which furnish interesting information on the expedition commanded by the late Captain Bia (see *Geographical Journal* for March, p. 227). Capt. Bia with his companions, Lieut. L. Francqui, Lieut. E. Derscheid, Dr. Cornet, a geologist, and Dr. J. Amerlinck, arrived at Bunkeya on January 30th, 1892, where a fearful famine, which cost the lives of three hundred and forty-five men out of a total of five hundred and ninety-eight with whom he had started from Lusambo, detained him until the beginning of April. The corn began to ripen then, and he removed to Kipuna, a village on the Lufira, about 16 miles from Bunkeya. Rumours of the movements of two representatives of the British South Africa Company in the country to the east of the Luapula rendered an early start desirable. Capt. Bia consequently, accompanied by Lieut. Francqui and one hundred and twenty-eight men, left on April 15th. On the 25th he reached the western shore of the Mweru. He examined the southern extremity of the lake, partly in a boat, and found that it nowhere exceeded 20 miles in width. The Mofwe, on the shore of which stands the residence of the Kazembe, is described as a distinct lake, about 16 miles long by ten in width. The Luapula, opposite Kazembe's town, is about 1630 feet wide and has a depth of 20 feet when in flood. Capt. Bia followed this river upwards, to near where it leaves the swamps lying to the south of Lake Bangweolo. He found it navigable as high up as the Mere Mere (Miele-Miele) Falls. Kinyama, one of the chiefs of the Bahusi, not only accepted the Company's flag, but also intrusted Capt. Bia with his nephew and successor, who is to be educated at Boma. After a visit to Chitambo's old village, where he attached a brass plate,† commemorating Dr. Livingstone's death, with which he had been intrusted by the English missionaries at Bunkeya, to a tree, Capt. Bia turned to the west, and on August 5th he rejoined his companions at Ntenke. Dr. Cornet, during his leader's absence, had explored the Konde-Rungo (Kundelungu) mountain, which divides the basins of the Zambesi and the Congo. He there visited the cave-dwellings of the Balomoto, high up on the escarpment which these mountains present towards the valley of the Lufira. Capt. Bia died at Ntenke on August 30th.

Lieut. Francqui, upon whom devolved the command of the expedition, left Ntenke on September 14th, and in seven marches across a broad table-land, he reached the source of the Lualabe. He followed that river

* Compare the maps in *The Geographical Journal* for February and March.

† This brass plate bears, as was stated in *The Geographical Journal* last month, the simple inscription, "Dr. Livingstone died here May 1st, 1873." It was provided by Mr. Bruce, Dr. Livingstone's son-in-law.

downwards, past the Nzilo Falls, as far as the Lubudi, which joins it from the west. On that river Dr. Cornet made the interesting discovery of flint implements. Then going west, Capt. Francqui reached the source of the Lubilash (Sankuru), traced that river downwards to its confluence with the Luwembi, and ultimately proceeded by way of Lupungu and Gongo Lutete to Luzambo, his starting-point, where he arrived on January 10th. Altogether the expedition marched nearly 4000 miles. Numerous positions and altitudes were determined. Dr. Cornet collected materials for a geological map, and altogether this expedition, jointly with that led by M. Delcommune, promises to yield scientific results of considerable value and interest.

THE ANTARCTIC WHALERS.

Letters dated March 9th from the Falkland Islands give some information of the movements of the Dundee whalers supplementary to the telegram referred to in last month's *Journal* (p. 362). As we feared no high latitude was reached, and the meteorological and other observations will consequently not have the value we hoped for. Icebergs of enormous size were met with, and the floes are in some cases reported as from 20 to 50 miles in length. The following is the official report as communicated to the newspapers by Mr. R. Kinnes, the agent for the Dundee vessels:—"The *Active* (Captain Robertson) and the *Balæna* (Captain Alexander Fairweather) left the Falkland Islands on December 11th. After a week's steaming to the south in each other's company they reached the ice. On the 19th, however, a thick fog suddenly enveloped the ships, with the result that they passed each other, and thus got separated. The foggy weather continued unabated until the 23rd, when it sufficiently cleared, and, to the surprise of all, it was found that the *Active*, the *Balæna*, and the *Diana* (Captain Robert Davidson) were in close proximity to each other. At this time the weather was cold and stormy; but, notwithstanding this, the captains and men adopted every expedient with the object of securing a catch. They cruised about in search of whales until January 2nd, proceeding as far as 67° S. No whales of value, however, were seen, the only varieties that were observed being finners and hunchbacks, which are quite worthless for the purpose the Dundee skippers had in view. The *Active*, however, managed to get fast to a large whale, the variety of which is not mentioned. Unfortunately it was lost, the harpoon having drawn. Seals were plentiful, and in a comparatively short time good catches had been secured, and between oil and skins the vessels were soon full. The skins are described as being very large, although their ultimate value remains to be seen. There was abundance of ice; but all the time the weather was extremely stormy. Had the atmospheric

conditions been more favourable, the captains state that they would have proceeded further south and remained as long as possible, with the view of discovering the real Greenland whale, as they had hopes that the variety they were in quest of might be found in more southern latitudes. The captains are of opinion that this season must have been one of unusual storm and severity. It will be remembered that Captain Sir James Ross remained in the Antarctic Seas until well on in May. This year, however, such a stay would have been impossible, owing to the state of the weather. The *Balæna* left the Falkland Islands for home on February 28th, and it is surmised that the others left about the same date. According to Mr. Kinnes's information the catches of seals are as follows—*Balæna*, 6000; *Active*, 4000; *Diana*, 4000; *Polar Star*, about 2000, each with large quantities of oil."

It will be remembered (*Proceedings* for 1892, pp. 637 and 862) that several of the vessels were equipped with additional chronometers, compasses, and other appliances for scientific navigation by the Royal Geographical Society, while the Meteorological Office supplied standard barometers, thermometers and hydrometers for atmospheric and oceanic observations. Mr. Leigh Smith, a large shareholder in the venture, equipped the *Balæna* with photographic apparatus, and with a complete set of appliances for all kinds of scientific collecting and preserving. The captains of the vessels cordially promised to do all in their power, consistently with their duty to the owners, to further scientific observations and collections; and, at the same time, they agreed to send in to the Society on their return a log of the voyage, embodying the routes, soundings, and position of any land seen in the far south. By the kind intervention of Mr. Leigh Smith, the surgeons of the *Balæna* and *Active* were selected on account of their knowledge and enthusiasm as observers and naturalists. In this way the Society did all in its power to make a daring commercial venture of solid service to geography and to science in general. The surgeons, who shared with the captains the regular meteorological observations, have written short notes, in which they state that all opportunities afforded them for work have been taken advantage of to the uttermost; but that the results are less than they could have wished. They prefer, with perhaps a somewhat exaggerated sense of courtesy, to delay reporting on their scientific work until the return of the vessels, so that the captains may be able first to complete and submit their logs. The return of the ships may be expected early in June. A Norwegian sealer, the *Jason*, was also in the Antarctic regions this season, and returned rather before the Dundee vessels with a cargo of about five thousand seals. The nature of the seals is not known, no authentic information having been published on the subject. They probably belong to more than one species, and appear to be different from the common Greenland seal; but it is doubtful whether the true fur-seal was met with.

THE MONTHLY RECORD.

THE SOCIETY.

Royal Medals and other Awards for 1893.—The Royal Medals of this year for the encouragement of geographical science and discovery have been awarded by the Council as follows:—The Founder's Medal to Mr. Frederick Courtney Selous in recognition of his twenty years' explorations and surveys in South Africa. The Patron's or Victoria Medal to Mr. W. Woodville Rockhill for his travels and explorations in Western China, Koko-nor, Tsaidam and Tibet, and his observations on the ethnology and languages of the countries visited, published in his work, 'The Land of the Lamas,' for the enterprise and intrepidity shown by him, and for his years of study of the native languages to prepare him for these travels. The Murchison Grant has been awarded to Mr. R. W. Senior, who for several years in succession has carried out a most laborious duty in the higher ranges of Kulu and Lahaul, Punjab, the Himalayas; the results achieved in point of accuracy, expedition, and amount of work done, have been exceptional in the face of great hardships and great physical difficulties. The Gill Memorial to Mr. Henry O. Forbes for his explorations in New Guinea, the Malay Archipelago, and the Chatham Islands. The Cuthbert Peek Grant to Mr. Charles Hose for his explorations in Natural History Observations and Collections in Saráwak, North Borneo. The three Honorary Corresponding Members chosen are M. Vivien de St. Martin, the veteran French Geographer; Major J. W. Powell, Director of United States Survey; and Colonel Pevtsof, the well-known Russian explorer in Central Asia.

The Society's Prizes to Training-College Students.—The Royal Geographical Society's prizes for proficiency in Geography in the late examination of students in English training colleges, have been awarded by the Government examiners as follows:—Male students (prizes of £5 each): A. J. Catt, Borough Road Training College; R. W. Guppy, Exeter Training College; J. V. Semmens, Westminster Training College. (Book prizes): E. O. Cole, Exeter Training College; F. W. Millson, Borough Road Training College; W. H. Mizen, Borough Road Training College; E. A. Turner, Battersea Training College. Female students (prizes of £5 each): S. A. Crebbin, Whitelands Training College; L. S. Smith, Tottenham Training College; E. M. Williams, Stockwell Training College. (Book prizes): A. Baker, Ripon Training College; E. Hamlyn, Tottenham Training College; A. Nixon, Stockwell Training College; A Pilling, Stockwell Training College.

EUROPE.

Russian Forests.—The Government of Arkhangelsk is usually described as containing more than 75,000,000 acres of forest land. It now appears, from communications made at the St. Petersburg Society of Forestry, that there are in the government of Arkhangelsk not more than 14 to 16,000,000 acres of timber forests, and these have already been considerably destroyed along the chief rivers. Ten saw mills are at work at the town of Arkhangelsk.

Distribution of Population in Schleswig-Holstein.—A recent issue of *Forschungen zur deutschen Landes- und Volkeskunde* consists of a monograph on the distribution of population in Schleswig-Holstein, by Dr. A. Gloy, on the lines followed in the anthropo-geographical works of Ratzel. Certain aspects of the subject having been already dealt with in 1861 and 1886 by K. Jansen, the present work is concerned chiefly with the agricultural population, under the headings of (i.) the distribution of the settlements over the country, and (ii.) their type. The system on which density of population may be best shown on a map is first discussed. The author points out the drawbacks of the common method, and pronounces in favour of Ratzel's idea of actually representing each separate settlement in its proper position, with an indication of its size. A map of part of Schleswig-Holstein constructed on this system is given, a series of seven symbols being used to denote places with populations varying from over two thousand down to ten, while isolated farms are shown by mere points. This method makes the use of a large scale necessary, but a special point in its favour is the possibility of using colours to show geological or other features, on which the "wherefore?" of distribution mainly depends. Schleswig-Holstein may be divided lengthwise into three geological zones: on the east the hilly ridge of glacial origin, with fertile soil (the upper and lower *Geschiebemergel*); next a sandy tract, with patches of heath and bog, mostly of the formation called *Geest* in Germany; lastly on the west a very fertile strip of fen-land, formed of a more or less sandy mud abounding in mica. To avoid confusion the separate formations (except the fen-land) are not distinguished on the map, but the patches of forest, heath, and bog, which account for the absence of population in certain parts, are inserted. It is impossible to form an accurate comparison between the densities of the three zones, each taken as a whole, there being an aggregation of population on the western edge of the *Geest* owing to the vicinity of the fertile fen-land, but in the case of separate districts those are the densest which have the largest share of loamy or clayey soil. The well-peopled tract shown by the map near the east coast, between the bogs of Kiel and Lübeck, as well as in the Island of Fehmarn, is just that where the lower *Geschiebemergel*, the most fertile formation of this zone, is found. It may be observed here also how, with an evenly fertile soil, the villages are on the whole placed at even distances apart. Where the geological formations are confused we find an irregular distribution of villages and single farmsteads, as in the central zone. A great part of this consists of uncultivable heaths, and where there is a moderate population (as in the line of fair-sized villages west of Rensburg), it is an unfailing sign of the existence of insular patches of glacial formation. The large population already noticed at the western edge of the *Geest* is due, partly to the greater security offered by the higher land, while any danger from the sea still remained, besides that by this situation of the villages, more of the fertile land was left free for cultivation. This line becoming a natural highway from

north to south, a further factor in the increase of population was introduced. The larger villages of the fen-land occupy isolated elevations formed by sand-dunes; elsewhere single farms are common, especially in the Eiderstedt District, where much of the land is given up to cattle-rearing. Under the second main heading the prevalence of the Slav type of villages is noteworthy. This shows a fixed plan in its formation, which allows of little subsequent expansion. The two principal forms are: (i.) the *Rundling*, where the houses are arranged in a horse-shoe, or sometimes a circular form, round an open space: originally one opening served both for ingress and egress; (ii.) the *Strassendorf*, where we have either straight lines of houses on each side of a broad street, or an arrangement derived by a broadening of the street to allow space for the church, school, etc. This forms a connecting link with the former type. Villages in the form of a rectangle also occur, chiefly in Fehmarn, from which this may be called the Fehmarn type. Plans of actual villages illustrating these different forms are given. The *Rundling* is found rather in the west of the old Slav District (west of the Oder), while the *Strassendorf* is most common in the eastern provinces of the Empire. Of German types the *Haufendorf* is the predominant type in Schleswig-Holstein; that of the fen-land is another, with the houses arranged in a single line parallel to a dyke or causeway. Farmsteads and country houses complete the catalogue. The lists of Slav villages given show that the western limit of their extension coincides with that of the glacial loam, and where isolated patches of the latter occur further west, traces of the Slav race are also to be found. It would be interesting to compare this Slav limit with the course of the "*limes Saxoniae*" of Charlemagne, but our definite knowledge of the latter is scanty. There is no doubt, however, that the Slav race extended considerably to the west of the frontier laid down by that monarch.

ASIA.

The Afghan Frontier.—A dispute having arisen as to the respective rights of Afghan and Russian subjects at a point on the Afghan frontier almost due north of Herat, Colonel C. E. Yate has been deputed, with the consent of the Ameer Abdur Rahman, to discuss the question with a Russian officer, and if possible to effect a settlement. The difficulty relates to the use of water from the Kushk River for irrigation purposes. When the Anglo-Russian Boundary Commission reached the Kushk Valley in November, 1885, it was found that the Sarik Turkomans were in possession of the side valleys of the Kushk and Kashan Rivers; and the Russian Commissioner demanded that they should not be interfered with. The claim was resisted by Sir West Ridgeway, on the ground that it was contrary to the terms of the London protocol of September 1885; and the Sarik Turkomans were accordingly ousted, the boundary line being so drawn as to reach the Kushk River at a point a mile or two above Chaman-i-Bid. Some months later, when a difficulty arose as to the demarcation of the frontier in the neighbourhood of the Oxus, the English authorities, in order to secure Khamiab for the Afghans, consented to a re-adjustment of the boundary in the Kushk Valley; and the boundary pillars were removed some distance to the south. Since then, cultivation in the lands given up to Russia has been carried on not only by the Sarik Turkomans, but also by a

party of colonists from European Russia. It is now alleged that by diverting the waters of the Kushk for the irrigation of their own fields, the Aghans have deprived both Russians and Turkomans of their fair share in the river. The dispute, if left unsettled, might give rise to serious complications; but it is hoped that the joint Commission will be able to suggest a compromise satisfactory to both parties.

The Mission to Chitral.—The Hon. C. G. Bruce, who accompanied Dr. Robertson's mission to Chitral, gives in some private letters a lively account of the march of 200 miles through snow from Gilgit over the Shandur Pass (12,250 feet) in January last. The weather was cold throughout, when the party started in the morning the thermometer registering from 0° to 5° F., and bitter winds frequently blowing. They stopped for one day at the fort of Maating, the residence of the late Mehtar Afzul-ul-Ismilk (Aman-ul-Mulk) in an open plain surrounded by vast mountains at the meeting of three valleys and bitterly cold. Here the reigning Mehtar met the expedition and accompanied it to Chitral, where they were comfortably housed. The country seems to be in a very depressed state; three recent changes of kings accompanied by bloodshed and plundering have had their natural effect—the people seemed half-starved. The situation of Chitral is fine with grand views of lofty bare mountain slopes diversified by great scenes, while the fine, two-peaked mountain Tirech Mir, 25,000 feet high, fills up the head of the valley at a distance of 30 miles. Some Kafirs who came down from Kafirstan to see Dr. Robertson are described as a wild set of men, most independent in their bearing, very light and agile in their movements, having their heads shaved with the exception of one cherished tuft on the crown. Their favourite weapon is the dagger, although they also use the bow. They are magnificent mountaineers.

Dr. Radde's Expedition to the Western Caucasus.—An Odessa correspondent writes that Dr. G. Radde, Director of the Natural History Museum at Tiflis, a Medallist of the Society, started from Tiflis early in April on a four months' tour in the Western Caucasus and along the eastern shores of the Black Sea. He will then visit Nakalakevi, according to Dubois the birthplace of Medea, and the scene of the adventures of the Argonauts. Dr. Radde will also make collections in Sukhum Kale and along the Black Sea littoral to Novo-Rossisk. The Kuban district about Ekaterinodar will also be laid under contribution. From the Cossack Station of Psebai Radde intends crossing the Caucasus *viâ* Fisht to Sochi on the Black Sea, whence he will return to Tiflis, finishing probably in August.

Railways in China.—It is reported in the Chinese newspapers that the North China railway is to be extended immediately through

Manchuria to the Amur River, the survey for the proposed extensions being already completed. The line already runs from Tientsin to Tongku, near the Taku forts, a distance of 27 miles, and is continued for 67 miles further to the Tungshan and Kaiping coalfields, and for 40 miles beyond towards the Manchurian frontier. The strategic importance of a railway northward to meet the Russian railways seems at last to have overcome the obstinate conservatism of the Chinese government, and the many obstacles so long declared to be insurmountable have one by one given way. The possible expansion of railway enterprise in China is a fact of the first magnitude, geographically, commercially, and politically.

Vladivostok and Korea.—In his report on the trade of Korea for 1891, recently published (Foreign Office, 1892, *Annual Series*, No. 1088, Corea), Mr. W. C. Hillier, refers among other things to the future importance of Vladivostok. That port is rapidly becoming a commercial terminus of great importance, and as the construction of the Trans-Siberian Railway proceeds there appears to be little doubt that trade will largely increase. It is expected that a large portion of the brick-tea which now finds its way into Siberia *viâ* Tientsin and Kalgan will eventually be shipped from Hankow to Vladivostok, while the extension of the railway cannot fail to open up new districts, at present very sparsely inhabited, of which Vladivostok will become the centre. The exports from Korea to Vladivostok now consist almost entirely of cattle and food-stuffs, but a native passenger traffic is being developed, which is likely to expand as the demand for labour increases. The growth of this little-known Russian port during the past few years, even in its present condition of isolation, and ice-bound as it is during at least four months in the year, is very striking, and there is every reason to believe that when railway communication with the west is completed it will become one of the most important places in the far East. A large Chinese and Korean population is already established there, and vast tracts of apparently rich country remain to be opened up to the agriculturist. From the same report we learn that there is a steadily increasing immigration to Korea of Chinese and Japanese; these number in Söul alone about 1300 and 1000 respectively; while in Chemulpo there are 550 Chinese and 2330 Japanese; the numbers at Fusan being: Japanese 5255, and Chinese 138. Mr. Hillier also supplies in his report some useful hints regarding sport in Korea. Tigers, leopards, bears, and deer, appear to be plentiful, especially in the northern districts. Pheasants and wild fowl also abound. The country near the coasts is the resort of millions of wild fowl, swans, geese, duck, and teal during the season; while trout and salmon are plentiful in the streams on the north-east coast.

AFRICA.

Mr. J. W. Gregory's Expedition in East Africa.—Owing to the collapse of the expedition which left England in October, 1892, under the command of Lieut. C. Villiers of the Royal Horse Guards, Mr. J. W. Gregory, Assistant in the Geological Department of the British Museum, who had joined the party as geologist and naturalist, has been left alone at Mombasa. Lieut. Villiers' party only got as far as Ngatano on the Tana River, where the leader left them, and the other members returned to England. Mr. Gregory has, however, determined not to leave the

country until he has done some scientific work, and in a letter dated Mombasa, March 21st, 1893, states that he has organised a caravan of his own, and was to start for the interior on the following day. He intends to investigate the geology and natural history of the Ulu mountains, and of the chain of lakes from Naivasha to Baringo. The return journey will be made across the Lykipia plateau to the west base of Kenia, and Mr. Gregory will attempt the ascent of that mountain; being, however, the only European in the party, his difficulties will be considerable. Leaving Mount Kenia, he intends to proceed to the Sabaki River, the geology of the surrounding country being of special interest. In addition to his knowledge of geology and natural history, Mr. Gregory, before leaving England, further qualified himself as an explorer by taking lessons in practical astronomy and surveying from the Society's Instructor. It is therefore to be hoped that, notwithstanding the unfortunate collapse of Lieut. Villiers' exploring party, some useful work may yet be done by the only one of its members, who declines to return to England without doing something to add to our geographical knowledge.

Mr. Bent's Expedition to Abyssinia.—The following letter has been received from Mr. Theodore Bent, under date, Addi Huala, March 7th, 1893:—We have just got back to Italian territory again after having had a very anxious and dangerous sequel to our Abyssinian experiences. Directly after my last letter to you, news reached Adua that Ras Alula had rebelled again, and that Ras Mangascia was collecting an army and coming to Adua. We packed all our things in great haste, and were prepared for flight, but next day news was brought that the seat of war would be some days' journey from Adua, and the Italian Resident thought we might proceed to Aksum, but warned us to be prepared for flight at a moment's notice. We passed eight days at Aksum, with great profit, I hope, to ourselves and archæology, for though under the circumstances it was impossible to do any excavation, we found plenty of work amongst inscriptions, obelisks, &c., to keep us well employed for that time—taking squeezes, photos, measurements, &c. We then got intimation from the Italian Resident at Adua to depart immediately; that the war was assuming alarming proportions; that the north of Tigre was infested by bands of brigands; and that our ultimate retreat out of the country was very doubtful. We packed up in haste, and availed ourselves of the escort of a chief going to join Ras Mangascia to get back to Adua. There we found the Italian Resident in a great state of alarm. Ras Mangascia wanted both him and us to join him at the war, and refused to give us an escort to the Mareb. The road being infested with brigands, it seemed as if we were caught in a trap, and that the only thing was to join Ras Mangascia and take our chance in the war. We passed two very anxious days, not knowing what was going to happen to us. The Governor of Adua was exceedingly rude

to the Italian Resident, and things looked very black. Luckily, however, at the first intimation of difficulty, the Resident had sent on word here of the condition of affairs, and to our intense relief we got word that Lieutenant Mulazzani, with a force of four hundred men, had crossed the frontier and was coming to our relief. In this manner we got away, and reached Italian soil after a two days' march. This is quite the most unpleasant experience we have had during any of our travels, and I need hardly say we are enjoying a few days of rest and tranquillity here immensely. I think, in spite of our difficulties, we have done some good and important work at Aksum. We shall probably go on to Aden in a fortnight's time, and get back to England earlier than we expected.

The Equatorial Lakes and the Irrigation of Egypt.—In the sixteenth century we heard a great deal about Prester John's threat to divert the "Nile" into the Red Sea, and thus to deprive the unbelieving Egyptians of the supply of water so essential to their prosperity. Of course the Nile here referred to was neither the "Blue" nor the "White" Nile, but the Takazze, or Atbara, which, though very inferior to the two main branches of the great African river, nevertheless contributes very largely towards the annual floods. M. A. Chélu has quite recently pointed out that a similar danger would threaten the "low" Nile of Egypt, if a dam were to be built across the outlet of the Victoria Nyanza, as to the waters stored up in this huge equatorial lake Egypt is indebted for its summer supply. On the other hand these African lakes, in the opinion of practical engineers, might be converted into huge reservoirs, the supply from which could be regulated by a weir built across the outlet of the Albert Nyanza. It is claimed for this scheme that the supply of water obtainable would far exceed that obtainable in any other way, and that the cost would be infinitely less. Nothing, of course, can be done in this direction until Uganda and the old Equatorial province shall have been re-occupied by a civilised power.

Emin Pasha.—When Emin Pasha separated from Dr. Stuhlmann it was his intention to follow the divide between the Congo and Nile, and to make his way to Lake Tsad. If rumours current at Kampala (Uganda) can be trusted this bold scheme has been violently frustrated. Awad Efendi, an old Egyptian official, now in the service of the British East Africa Company, told Herr W. Wolf, the special correspondent of the *Berliner Tagblatt*, that Emin Pasha had left Kavalli on March 9th, 1892, that his caravan had been attacked on the Huri River by a band of Manyema under the orders of Ishmail, the wakil of Said-bin-Habid, and that Emin Pasha and all his followers had been massacred. This hearsay news certainly requires confirmation.

African Salt.—The importance attached to salt (chloride of sodium) by the natives of almost all parts of Africa is well known, and a

French company has recently introduced for purposes of trade specially made bars of pure salt, compressed and polished so as to be hard and easily carried. In the absence of any natural supply of common salt various substitutes have been made and used by savage tribes. M. Dybowski, on his recent journey on the Mobangi, noticed that the cannibal Bonjos collected plants of various orders which float down the river, and, after drying and burning them, extracted salt by means of solution, filtering, and subsequent evaporation. M. Demoussy publishes an analysis of this salt (*Comptes Rendus* 116 (1893), 398–400), which appears to contain no chloride of sodium whatever, its chief constituents being sixty-eight per cent. of chloride of potassium, and twenty-nine per cent. of sulphate of potassium. Further inland, toward Lake Chad, the natives were found to make and use with their food a "salt" of identical composition. The very small proportion of carbonate of potassium present in these salts is remarkable, and those species of plants which yield least carbonate on burning are evidently carefully selected. The Senegalese porters who accompanied M. Dybowski used the native salt freely without experiencing any ill-effects. It would be highly interesting to study the effect of potassium salts in large quantities on the system in the case of the Bonjos. The relation between cannibalism and abstinence from chloride of sodium noted in 'Robinson Crusoe' is curiously confirmed in this instance.

Present Condition and Prospects of Zanzibar.—Mr. Fitzgerald in his recent report on Zanzibar (Foreign Office, 1892, Miscellaneous Series, No. 266), enters somewhat fully into the agricultural conditions and prospects of this island, which at the present moment has acquired special interest on account of the British occupation, and the recent change of Sultan. The island of Zanzibar lies well within the tropics, between latitude 5° and 6° south of the Equator, and is from 25 to 30 miles distant from the mainland. The island is of coral formation, on a substratum of sandstone rock. According to Dr. James Christie—"The madrepore structure is evidently based upon the summits of an abrupt and sharp rising submarine range which, of course, must have been under the ocean-level at some remote period. By the action of the gradually subsiding waters a coralline conglomerate has been formed. On the southern and eastern parts of the island the deposit is more scanty. . . . Where sufficient deposits have been left the soil is fertile and the crops early, the porous understructure carrying off superfluous rains, but still retaining moisture and heat. Zanzibar, like all other madrepore islands, grows towards the leeward, and on that side the most fertilising deposits take place. Thus the barest and most infertile parts of the island are those exposed during the greater length of time to the influence of the long continuous south-west monsoon; and the most fertile are those sheltered from the violence of the south-west, and exposed to the north-east." The total area of Zanzibar may be put down at 400,000 acres, its greatest length being 50 miles, and its breadth from 20 to 27 miles. Zanzibar appears to differ materially from other tropical islands in the matter of possessing no mountain range; the low hilly ridge which takes its place traversing the island in its entire length, and almost through its centre, has by measurement been proved not to exceed a height of 440 feet. Another remarkable feature is the

apparently very large extent of land unfit for cultivation, which, according to a trustworthy authority, includes the larger part of the island. Zanzibar may be thus divided into two portions—the fertile and the barren. The latter extends over the coast lands of the eastern side, and nearly all the southern part of the island, and consists of an universal outcrop of sharp and jagged coral rock; but it is everywhere covered with low bush, vegetation, and grass. In this portion of the island the Wahadina people (the original inhabitants) reside. The fertile area covers the whole of the western and northern side, and also the eastern face of the central hilly range. As to the rainfall of Zanzibar—the result of the five years' meteorological observations taken daily by Dr. John Robb on Ras Shangam, the point of land on which the town of Zanzibar is situated, extending from 1874 to 1878, gives a total average fall of 61·01 inches. The fall was apparently evenly distributed, Zanzibar feeling the influence of both the south-west and north-east monsoon. According to Dr. Robb's observations, the mean temperature of five years is 80°·3, and the average yearly range from highest maximum to lowest minimum is 17°·3. Of the cultivated products of Zanzibar the clove and the coconut are apparently the most important. The clove tree (*Caryophyllus aromaticus*) is stated to be a native of the Moluccas, and appears to have been first introduced into Zanzibar by an Arab at the end of last century. The average length of life of the clove tree in Zanzibar appears to be from sixty to seventy years; owing, however, to the devastation resulting from the great hurricane of 1872, the average age of the trees now growing may be put down as below twenty years. The exports of cloves from Zanzibar in 1890 was 124,929 frasilas, and from Pemba in the same year, 385,981 frasilas; in 1891 the export from Zanzibar was 62,017 frasilas, and from Pemba, 326,986 frasilas. The coconut palm, like the clove tree, is found all over the fertile portions of the island, and to be very extensively cultivated. Other trees of importance cultivated in Zanzibar, are the areca nut, mango, jack, cotton-wood tree, papaw, foreign and native fruit trees and coffee. The alimentary plants include sugar-cane, bananas, rice, cassava, Indian corn, beans and peas, arrowroot, pine-apples, capsicums, and ground-nuts. The oil-plants are sesame and "mtono"; vegetables, sweet-potatoes, pumpkins, condiments, etc. The second part of the Report is occupied with the results of Mr. Fitzgerald's recent tour of inspection of the island for the purpose of studying the present position of native cultivation and agriculture, and more particularly of the spice industry. Mr. Fitzgerald's route may be briefly described as follows: North, from Zanzibar to Kokotoni, distance 21 miles, halting on the way at Chueni; south, returning from Kokotoni by Mdo, distance five hours to Dunga, distance from Mdo two hours and a half; east, visit to barren portion east of Dunga; west, Dunga to Zanzibar, distance 12 miles, visiting the Valley of Bonde la Maungu on the way. It will thus be seen that the whole of the more important portion of the cultivated area was traversed, while a brief visit was made to the more barren and exposed side of the island. There appears to be a very marked similarity of rainfall, temperature, and also of soil, between Zanzibar and the islands of the West Indies, and in Mr. Fitzgerald's opinion there can be no doubt that the products cultivated there, with the exception of those grown at higher elevations, can be successfully introduced here also. He also endeavours to show that the present products now growing are capable of very great development. With regard to the labour question which is affecting Zanzibar at the present time, Mr. Fitzgerald says: "Certainly this labour question is a most important one, and forms the basis on which future agricultural development must necessarily depend; and with the island mainly depending, as at present, upon one product like the clove tree, which especially requires a large labour supply, this becomes a most urgent and important matter." He is also of opinion that "to thoroughly develop the resources of Zanzibar, European enterprise is undoubtedly

the factor required, and the sooner this can be more largely attracted, the quicker will development commence."

Dr. Fleck's Journey Across the Kalahari to Lake Ngami.—In this journey, made in 1890, and now described in *Mittheilungen aus den Deutschen Schutzgebieten* (vol. vi., no. 1), Dr. Fleck traversed the little-known western part of the Kalahari. His routes may be followed on Kiepert's map in the same periodical, embodying the surveys of C. von François, who travelled in the same parts in 1890–92. Coming from the west, Dr. Fleck struck the upper Nosob at Andreas Lammert's *verft*. The territory of this chief is of vast extent, considering the small number of his people (about 1200). They are wretchedly poor, living chiefly on wild fruits. After following down the Nosob for some distance, our traveller struck eastward across a waterless region, where he encountered the usual troubles of such a journey. Having paid a visit to Mapaar, chief of the Kalahari Bechuanas, at his *verft* Hututu (wrongly Lehutitang on our maps), he struck northwards, again experiencing want of water, and joined the direct route from Rehoboth to Lake Ngami, taken by previous travellers, at Gansis. Passing along the west shore of the lake, and with some trouble getting his waggon across a branch of the Okavango, he at length reached the town of Moremi, the Bechuana chief of this district. This is further north than it is placed on the map, being close to the sharp bend of the Okavango. Dr. Fleck describes the Kalahari as not a desert—everywhere is good grass, succulent bushes and green trees, large-leaved species of *ficus*, etc., being common. At first the trees and bushes were continuous, but later they occupied the tops of the sand-dunes, the hollows being filled with grass. The soil is a red sand, alternating with strata of limestone resting horizontally on the ancient formations. When this is pierced, a better supply of water will probably be obtained. The Bakalahari (Bechuanas) are crafty and indolent, but the Bushmen are easier to deal with. The periodic rains allow the former to grow Kafir-corn, maize, water-melons, etc. They also have some cattle. The Bushmen live on wild fruits. The neighbourhood of Lake Ngami is much praised for its beauty and fertility, and might, Dr. Fleck says, become a paradise in the hands of Europeans. Only a small part of the surface is at present cultivated. The neighbourhood of Moremi's town is uninteresting, but near the river large-leaved trees covered with gay creepers abound. With care the climate is healthy, the natives suffering chiefly through their own excesses. All traces of fever disappear when the flood comes down the river in the dry season, which consists merely of a series of pools. The chief showed no signs of energy or intelligence, and no good character can be given to the people. A strange custom is the assemblage of the young girls from all parts of the country for a three-months' course of instruction in their future duties as wives. Every night they parade the streets masked, and make the whole place resound with singing, shouting, stamping, and beating of drums. An excursion along the southern shore to the only spot where the reeds (papyrus, etc.) allow access to the water gave an opportunity for examining the lake from a canoe. Its shores abound with pelicans, ibis, and other birds. Its depth seems very slight. Other large lakes of this nature must have existed within historic times, and the limestone strata, a large area of which is crossed by the road from the south-west, are the deposits formed on their beds. It may be noticed that the surveys of Von François above mentioned considerably alter the map of the Western Kalahari, for which that of Th. Hahn (Cape Town, 1879) has been the chief authority hitherto. The middle course of the Nosob, for instance, is shifted a long way to the west, as also the Hogskin *Vley* in Vilander's country. According to Kiepert's map almost all the latter would seem to lie west of the German boundary, though a large portion of it has been recently annexed to British Bechuanaland.

AMERICA.

Topographical Work Done by the Appalachian Mountain Club.—The February number of *Appalachia* contains a map on which all the prominent summits in New England and Eastern New York are indicated. Many of these, especially those located in the White Mountains and the adjacent district of the State of Maine, are from the original work of members of the Appalachian Mountain Club, which has already been published. In addition to these, only the determinations of other accurate surveys have been used in the construction of the map, and since such surveys have not been completed in Maine, New Hampshire, Vermont, and New York, it follows that the map is incomplete in those parts, while in other districts the position of more points have been determined than can be placed on the map without overcrowding. As regards the map itself it is a somewhat rough production without hill-shading or contours, and is chiefly remarkable as being the work of members of a club who, by their praiseworthy efforts, are making valuable contributions to the knowledge of the topography of this part of the United States.

Jamaica.—In the Annual Colonial Report for 1891–92 on Jamaica, some details are given as to the possibilities of the country. The island contains about 2683 acres, and of this 413,000 are level ground. There are 640,000 acres under cultivation, although of this amount more than half is in common pasture. Along the centre of the island run ranges of hills attaining an elevation in the west of 1800 feet, and in the east of 7500. Consequently there is a great variety of soil and of climate, and almost every tropical product, and many products of the temperate zone, can be successfully cultivated. The north of the island is several degrees cooler than the south, because Jamaica lies with its larger axis from east to west, and the constant north-east trade wind serves to keep the northern coast cooler. All round the coast there is a strong sea-breeze by day and a cool land-breeze at night. During the year 897 miles have been added to the main-road system, several of the dangerous rivers on the north side have been bridged, and in the course of the next three years it is hoped that every river in the island will be bridged. The sudden and dangerous river-floods annually occasion the loss of many lives. It is expected that within two years the extension of the railway to Montego Bay will be completed. From the report on the Botanical Department we learn that the Hope Garden is gradually being formed into a geographical garden, the total area of which is 212 acres. Of this, 38 acres have been left in wood; some space has been devoted to economic plants, sugar-canes, and hemp; large numbers of ferns have been planted, and much of the ground has been left covered with Bahama grass. In the island there are several mineral springs of great value, and the general climatic conditions are beneficial for sufferers from lung-diseases.

Geographical Distribution of Animals in South America.—In a letter to the Société Scientifique du Chile, Dr. H. von Thering, naturalist of the National Museum of Rio de Janeiro, calls the attention of that society to the curious relations that exist between the faunas of South Brazil and Chili, which he is now carefully studying.

Studies in the Strait of Magellan.—MM. Lemétayer and Blanchard have been lately studying the climate of Punta-Arenas, the Chilian settlement in the Strait of Magellan. M. Blanchard succeeded in making eucalyptus grow in the open air. Dr. Frederico T. Delfin has been studying the natural history of Punta-Arenas.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

Cable-Soundings in the Pacific.—Commander Tanner, U.S.N., describes the recent work of the U.S. ships *Albatross* and *Thetis* in surveying possible routes for a cable between San Francisco and the Hawaiian Islands in the last number of the *Transactions* of the Geographical Society of the Pacific. He commenced work in the *Albatross* on October 11th, 1891, off Salinas in the Bay of Monterey at the head of a great submarine cañon which carried deep water close to the shore. The axis of this trough was followed until oceanic depths were reached, and a great-circle course was then followed to the island of Oahu, soundings being taken at intervals of 5, 10, and finally 15 miles. The gradual increase of depth continued for 486 miles from Salinas, where it was 2895 fathoms, then gradually diminished to 2014 fathoms about 690 miles from the Californian coast. This elevation was steeper on the western side, and in crossing it close soundings were made. For 146 miles farther the line showed depths of 2400 to 2700 fathoms. On another trip the ship passed within 8 miles of the elevation previously found without any change of depth. A somewhat remarkable depression with one sounding of 3186 fathoms was found in 31° 54′ N., 136° 44′ W., which was the deepest water found on the survey. A slight rise followed on which, at a depth of 2085 fathoms, particles of sand were detected by the microscope in the ooze which covered the bottom, a circumstance of very rare occurrence. A stretch of 700 miles followed with average depths of 2900 fathoms; but 210 miles from the east end of Oahu an elevation with a depth of 1256 fathoms was found separated from the land by a depression of over 2800, fathoms. Several lines of soundings were taken up the relatively steep slope to the coast, all of which showed a gradual rise forming a good bed for a cable. Waikiki, about 3 miles from Honolulu, was fixed on as the best landing-place for a cable. On December 12th, 1801, the *Albatross* started to sound a rhumb-line to San Francisco, the maximum divergence of which from the great-circle route followed in the outward voyage was 70 miles. From a depth of 603 fathoms 20 miles from land there was a descent of 1178 fathoms in 4 miles, a slope of 1 in 3·5, but notwithstanding its steepness no rocks were indicated. On the whole the character of the depths was similar to that of the outward voyage, the greatest depth met with being 3038 fathoms. There were several gentle rises on which the depth was under 2000 fathoms. Commander Reiter on the U.S.S. *Thetis* surveyed a third possible line for the cable in April 1892 from Point Conception to Hilo in Hawaii. Similar conditions were found, the most notable rise, named after Reiter, occurring on the great-circle course 405 miles from Point Conception with only 976 fathoms over it, while the surrounding ocean bed had a normal depth of 2500 fathoms. The later part of the line showed greater depths and a more rugged sea-bed with signs of recent volcanic disturbance. The maximum depth of 3228 fathoms occurred within 230 miles of Hawaii, indicating an extensive trough surrounding the whole island-group on the east. The *Albatross* great-circle line was 2091 miles, the *Thetis* line 2050 miles in length. No obstacle remains to the laying of a cable save those of an economic kind.

CORRESPONDENCE.

Why are the Prairies Treeless.

PRYORS, BROOMFIELD, CHELMSFORD.
Feb. 7th, 1893.

SIR,—I have received from Professor G. M. Asher, LL.D., the accompanying interesting letter in reference to my article, "Why are the Prairies Treeless?" which appeared in the *Proceedings* of the Society in February last (pp. 78–100). With Professor Asher's consent, I send it for publication in the *Geographical Journal*. In so doing, I may perhaps be allowed to remark that, whether or not my somewhat bold contentions ultimately prove tenable, I do not admit that Professor Asher's criticisms (interesting though they certainly are) in any way controvert them.

In my article, I spoke of the American prairies only. I was careful to explain (p. 99) that the other treeless grass-covered areas of the world might, or might not have been due to burning; but of them and their origins I knew nothing personally. Professor Asher argues that the Russian Steppes are not treeless by reason of frequent burnings (which may be, and no doubt is, quite correct); but it does not follow that the American prairies are not treeless through that cause. I can only again assert my belief that they are. Dr. Asher's remarks show that there are no traditions of an ancient forest growth having once covered the Steppes. With the prairies the case is widely different, and there is the clearest evidence that enormous areas have, within recent years, been converted from forest into prairie by fire. Again, Professor Asher states that, on the Russian Steppes trees can only be grown by means of laborious irrigation. On the prairies of America, I have shown that the case is widely different. Professor Asher's statements as to the presence of "salt" on the Steppes, show that, in this respect, they closely resemble the prairies, on many parts of which "alkali" abounds. On the Russian Steppes (so far as I know, for Professor Asher does not allude to the point), fires are not, and never have been, prevalent; while on the prairies they are annual; and I say again that, if fires did not originate the prairies themselves, at any rate they have enormously extended their area, and are still doing so.

I am, yours faithfully,

The Editor of *The Geographical Journal*. MILLER CHRISTY.

29, DUKE STREET, BLOOMSBURY,
Jan. 23rd, 1893.

SIR,—Your interesting essay under the title, "Why are the Prairies Treeless" (which you send me because I am acquainted with the Steppes of Eastern Russia) takes, I believe, too narrow a view of the question, else you would scarcely entertain the idea that the treeless condition of the Prairies is due to fire.

Not only are the prairie regions of North America and the Steppe regions of Eastern Russia covered with wild-grown grasses, but so also are many other wide tracts, especially in Southern America and in Western and Central Asia; and much land that is now cultivated has, within the memory of man, or in prehistoric times, likewise been Steppe. Such being the case, the first thing to ask is, whether it is probable that, in accordance with your theory, a considerable portion of the Steppe lands was deprived by fire of trees with which it had been covered, so as to be turned from forest into Steppe.

Now such an origin of the grass-covered lands seems to me very unlikely, for the simple reason that land covered with wild-grown grasses can have no other inhabitants than nomads or savage hunters, that is to say, populations very scanty in proportion to the territories they roam over, and that such tribes are quite unfit

for the labour of clearing away primæval forests, so as, by means of fire, to transform them into grass lands. The smallness of the numbers is strikingly illustrated by the fact that, in January 1771, all the Kalmuks that had been roaming over the Steppes between the River Volga and the border of Asia escaped across that border, leaving those Steppes empty; and it is quite certain, from the records of the German colonists who arrived in those parts in 1764, that the Steppe was then as treeless as it now is.

It is also very unlikely that the subsoil of the Steppe lands is favourable to the nourishment of the roots of trees, considering that, even along watercourses, the groves planted by Mennonites and the laboriously irrigated orchards of Cossacks grow scantily, and that, for keeping fruit-gardens alive at a short distance from the Volga, incessant irrigation is necessary.

This observation raises doubts in regard to the richness of the subsoil of the Steppes. Does, indeed, the black earth, far beneath the surface, contain an abundance of organic substances? That it does not is rendered almost certain by the experience of German colonists that when the banked-up ground for potatoes is washed away by floods the land is almost without value.

Finally we cannot help noticing that the presence of salt on the surface is a common characteristic of all steppes, and that on some steppes (for instance those of the province of Astrakhan) the quantity of salt on and near the surface is still such that trees cannot possibly grow. How poor, for instance, is the result of the pains taken since 1764 by the Herrnhuters of the German colony of Sarepta, on the border of the province of Astrakhan. Higher up the River Volga, the steppes on both banks that have been turned into agricultural lands, now certainly have, on the surface, much less salt than they had in 1764, when the Germans arrived; and, even in the province of Astrakhan, enormous quantities of salt have been washed into the hundreds of lakes. This presence and washing off of salt evidently are important points for the thorough investigation of the question raised by you.

The conclusion I draw from what has above been said is that the question of the treelessness of steppes is not easy to settle, and that a thorough inquiry into it must needs be complicated. Much that is necessary for it cannot be known from existing researches.

As to the practical point of the growing of trees for timber and shade on Canadian steppe land the spontaneous spreading of trees will even, if possible, be of small advantage. Poplars and willows, the only trees that, as far as your essay shows, tend to spread, are of little value. For the systematic planting of forest trees, highly qualified men can easily, and at very moderate terms, be engaged in Russia.

My dear sir, faithfully yours,

G. M. Asher, D.L.

Late Prof. Univ. of Heidelberg.

The Ruins in Mashonaland.

15, Walmer Crescent, Glasgow.

April 17th, 1893.

Sir,—I do not agree with what Dr. Schlichter says about the ruins in Mashonaland in the April number of *The Geographical Journal*, and regard the theory which he proposes in *Petermann's Mitteilungen* as quite inapplicable to these ruins. But as I am about to revisit Mashonaland, and hope to get further information from the ruins themselves, I shall in the meantime reserve any further remarks I may have to make on Dr. Schlichter's criticism.

Yours, etc.,

Robert M. W. Swan.

The Editor of *The Geographical Journal*.

MEETINGS OF THE ROYAL GEOGRAPHICAL SOCIETY, SESSION 1892-93.

Tenth Ordinary Meeting, March 27th, 1893.—The Right Hon. Sir MOUNTSTUART E. GRANT DUFF, G.C.S.I., F.R.S., President, in the Chair.

ELECTIONS.—*Captain James Andrew Thomas Bruce, R.N.; John Buchanan, C.M.G.; Major R. B. Burnaby (East Surrey Regiment); Archibald Ewing; William Thomas Greenup; Rev. William Parr Greswell; Albert Kahn; Dr. Harold Low, M.A., &c.; John Alison McLaren; H.R.H. The Duke of Orleans; Lieut. Henry Thomas Pease, A.V.D.; Edmund Schluter; Ernest W. Smith; John Wicks; Colonel Elliott Wood, R.E., C.B.; Norman Wrigley.*

The Paper read was:—

"Do Glaciers Excavate?" By Professor T. G. Bonney, D.SC., LL.D., F.R.S.

There was an exhibition of photographs and maps in the tea-room.

GEOGRAPHICAL LITERATURE OF THE MONTH.

Additions to the Library.

By HUGH ROBERT MILL, D.Sc., *Librarian*, R.G.S.

EUROPE.

Alps—Cimone della Pala. **Wundt.**

Die Besteigung des Cimone della Pala. Ein Album für Kletterer und Dolimiten-Freunde. Von Theodor Wundt. Mit 24 Lichtdrucken und zahlreichen Autotypien nach photographischen Originalen. Zweite Auflage. Stuttgart, Greiner & Pfeiffer (not dated, 1893?): oblong, pp. 72. *Price* 10*s.* 6*d.*

Apennines. *Cosmos* **11** (1892): 129–151. **Stefani.**

Le pieghe dell' Appennino fra Genova e Firenze. Contribuzione allo studio sull' origine delle montagne. Pel Prof. Carlo De Stefani.

A geological study of the northern part of the Apennine Range, with a map and numerous diagrams.

Austria—Wippthale. *Sitzungsb. Akad. Wiss. Wien* **100** (*Ab. I.*) (1891): 448–463. **Marilaun.**

Die Verschiebungen der Wasserscheide im Wippthale während der Eiszeit. Von Dr. Fritz Kerner v. Marilaun.

Geological considerations throwing light on the configuration of a district during the Ice Age, with maps.

England—Derbyshire. **Leyland.**

The Peak of Derbyshire, its Scenery and Antiquities. By John Leyland, with illustrations by Alfred Dawson and Herbert Railton. London, Seeley & Co., 1891: 8vo, pp. 12 and 340. *Price* 7*s.* 6*d.*

A beautifully illustrated bit of local geography.

England—Essex. **Barrett.**

Essex: Highways, Byways, and Waterways. Written and illustrated by C. R. B. Barrett. London, Lawrence and Bullen, 1892: sm. 4to, pp. xvi. and 228. *Price* 12*s.* 6*d.*

Do. do. Second Series, 1893: sm. 4to, pp. xvi. and 232. *Price* 12*s.* 6*d.*

The illustrations are finely executed etchings and wood engravings representing the chief architectural and other features of the county.

England, Mendip Hills. **Compton.**

A Mendip Valley, its Inhabitants and Surroundings, being an enlarged and illustrated edition of Winscombe Sketches. By Theodore Compton, with original illustrations by Edward Theodore Compton, and a chapter on the geological history of the Mendips, by Prof. C. Lloyd Morgan. London, Stanford, 1892: pp. x. and 288. *Price* 10*s.* 6*d.*

Without being consciously a geographer the author has with a charming and sympathetic touch brought out the effects of geographical conditions upon the people and means of communication of a rural parish.

England—The Mersey. **Richards.**

Report on the Present State of the Navigation of the River Mersey (1892) to the Right Honourable the Commissioners for the Conservancy of the Mersey. By Admiral Sir G. H. Richards, K.C.B., F.R.S., Acting Conservator of the Mersey. With map and appendix. London, Eyre and Spottiswoode, 1893: 8vo, pp. 20. *Presented by the Commissioners.*

England—Topography. **Gomme.**

The Gentleman's Magazine Library: Being a classified collection of the chief contents of the Gentleman's Magazine from 1731 to 1868. Edited by George Laurence Gomme, F.S.A. English Topography [Part I.], 1891: 8vo, pp. viii. and 372. Part II. 1892: 8vo, pp. viii. and 328. Part III., 1893: 8vo, pp. xii. and 362. London, Elliot Stock.

A valuable collection of references to the topography, antiquities and general local circumstances of the English counties. Part I. deals with Bedfordshire, Berkshire, and Buckinghamshire. Part II. with Cambridgeshire, Cheshire, Cornwall, and Cumberland. Part III. with Derbyshire, Devonshire, and Dorset.

Finland. *Fennia* (1892): No. 6, pp. 184. ——

Komiténs för Revisions af Finlands Kartverk Underdåniga Betänkande.

A report with maps and summary in French of a Committee of the Finnish Parliament on the cartographical material available for maps of Finland.

France—Lorraine. **Auerbach.**

B. Auerbach, Professeur de Geographie à la Faculté des Lettres de Nancy. Le Plateau Lorrain, Essai de Geographie regionale. Avec 24 croquis cartographiques de J.-V. Barbier et 21 vues photographiques. Paris, Berger-Levrault et Cie., 1893, 8vo, pp. xxiv. and 360. *Price* 5 *fr. Presented by the Publishers.*

This interesting volume, which treats local geography in an exceptionally scientific manner, will be the subject of a special review.

France—Maps. ——

Catalogue des cartes, plans et autres ouvrages publiées par le Service Geographique de l'Armée, 1892. Paris, Baudoin: 8vo, pp. 80, plates 11. *Price* 1*s.*

France—Montpellier. *Bull. Soc. Languedocienne Geog.* **15** (1892): 530–580. **Viala.**

Formation Basaltique de Montpellier. Rapports de direction des fissures filoniennes avec les systémes de montagnes. Par L. Fernand Viala.

Germany—Pinewoods. **Höck.**

Nadelwaldflora norddeutschlands. Eine pflanzen-geographische Studie. Von Dr. E. Höck in Luckenwalde. Mit einer Karte. Stuttgart Engelhorn, 1893: 8vo, pp. 56. *Price* 3 *m.*

Part 4 of Vol. VII. of Kirchhoff's *Forschungen zur deutschen Landes- und Volkskunde.*

Greece—Ithaca. **Seillière.**

Ernest Seillière. Une Excursion à Ithaque. Dessins de Pierre Vignal d'apres les photographies de l' auteur. Paris, Allison et Cie., 1892: 4to. pp. 76. *Many illustrations. Price* 15*s.*

A sumptuous edition of the journal of a tour in Ithaca, with fine illustrations.

Hungary—Szegedin. *Bul. Soc. Hongroise Geog.* (*Ab.*) **20** (1892): 91–107. **Hajagos.**
Die Einmündung der Maros in die Tisza. Von Emmerich Hajagos.

Abstract of a Hungarian paper on the confluence of the rivers Maros and Theiss, with an account of the present state of works for protecting the town of Szegedin from inundation. Of considerable interest as describing the process of deposition of solid matter from very slowly moving bodies of water, observed under perhaps the most favourable conditions known.

Montenegro. *Zeitsch. deutsch.-österreich. Alpenvereins* **23** (1892): 124–170. **Hassert.**
Der Durmitor. Wanderungen im montenegrinischen Hochgebirge. Von Dr. Kurt Hassert.

Russia—Karelia. *Fennia* (1892): **7** No. 2, pp. 128. **Rosberg.**
Ytbildningar i ryska och finske Karelen med särskild hänsyn till de karelska rand-moränerna. Af. J. E. Rosberg.

An account with maps, sections and views and German summary, of the great terminal moraine which stretches from Vilmanstrand northward to the White Sea.

Strategical Geography. **Maguire.**
The Strategical Geography of Europe. By T. M. Maguire, Esq., LL.D. 8vo, pp. 20. *From the Proceedings of the Royal Artillery Institution for April*, 1893.

Tibet. **Bishop.**
Among the Tibetans. By Isabella L. Bishop, F.R.G.S. 4to, pp. 7, *illustrations. From the 'Leisure Hour' for February and March* 1893.

ASIA.

Asia-Minor. *Sitzungsb. Preuss. Akad. Wiss. Berlin* (1892): 969–982. **Virchow.**
Ueber den troischen Ida, die Skamander-Quelle und die Porta von Zeitunlü. Von Rud. Virchow.

Ceram. *Jahresb. Verein. Erdkunde Dresden* **22** (1892): 129–217. **Ribbe.**
Ein Aufenthalt auf Gross-Seram. Von C. Ribbe.

China. **Bertrand.**
Exposé d'une Communication sur Tientsin, Péking, la grand muraille de Chine, Résidence Impériale de Djehol (Mongolie intérieure), les tombeaux des Mings, la Passe de Nan-Koon faite a la Société de Géographie de Genève le 6 Janvier 1893. Par Alfred Bertrand. Genève, Aubert-Schuchardt, 1893: 8vo, pp. 32. *Reprinted from le Globe. Presented by the Author.*

China. **Fritsche.**
Ueber die Bestimmung der geographischen Länge und Breite und der drei Elemente des Erdmagnetismus durch Beobachtung zu Lande sowie erdmagnetische und geographische Messungen an mehr als tausend verschiedenen Orten in Asien und Europa; ausgefuhrt in den Jahren 1867–1891. Von Dr. H. Fritsche. St. Petersburg, 1893: 8vo, pp. 110, *maps. Presented by the Author.*

Gilyak Language. **Schrenck, Glehn, and Grube.**
Giljakisches Wörterverzeichniss. Nach den Originalaufzeichnungen. Von L. v. Schrenck und P. v. Glehn. Zusammengestellt und mit grammatischen Bemerkungen versehen. Von Dr. Wilhelm Grube. St. Petersburg, 1892: roy. 4to, pp. 150. *Price* 5*s.*

This is the first part of the third volume of Schrenck's 'Reisen und Forschungen im Amur-Lande in den Jahren 1854–1856.'

Himalayas. **Whymper.**
Ascents in the Himalayas. By Edward Whymper, 4to, pp. 9. *From the 'Leisure Hour' for January and February* 1893.

India—Census. *Journ. Roy. Stat. Soc.* **56** (1893): 1–43. **Baines.**

Distribution and Movement of the Population in India. By J. A. Baines. *With discussion.*

India—Dehra Dun. **Pope.**

The Dehra Dun—Forests. By C. W. Pope. 8vo, pp. 22. *From the 'Calcutta Review,' January* 1893.

India—History. **McCrindle.**

The Invasion of India by Alexander the Great as described by Arrian, Q. Curtius, Diodoros, Plutarch and Justin; being translations of such portions of the works of these and other classical authors as describe Alexander's campaigns in Afghanistan, the Panjâb, Sindh, Gedrosia and Karmania, with an Introduction containing a Life of Alexander, copious Notes, Illustrations, Maps and Indices. By J. W. McCrindle, M.A., &c., late Principal of the Government College, Patna. Westminster, Constable and Company, 1893: 8vo, pp. xvi. and 432. *Price* 18*s.*

India—Jaunpur. **Führer** and others.

The Shargi Architecture of Jaunpur; with Notes on Zafarabad, Sahet-Mahet and other places in the North-Western Provinces and Oudh. By A. Führer, PH.D. With drawings and architectural descriptions by Ed. W. Smith. Edited by Jas. Burgess, LL.D., C.I.E. Calcutta, 1889 (Vol. I. New Series, Archæological Survey of India): fo. pp 76, plates 72. *Presented by the Secretary of State for India.*

India—Sahibganj and Rajmahal. **Beveridge.**

Sahibganj and Rajmahal. By H. Beveridge, C.S. 8vo, pp. 8. *From the 'Calcutta Review,' January* 1893.

Japan—Abukuma. *Journ. Coll. Sci. Japan* **5** (1893): 197–293. **Kotô.**

The Archæan Formation of the Abukuma Plateau. By B. Kotô, PH.D.

Professor Kotô gives an account of the topography, and a detailed study of the geology of the Abukuma Plateau toward the north of Hondo, with map and plates.

Korea. *Export* **15** (1893): 105–106, 119–121, 136–137, 167–170. **Brass.**

Reise durch Korea. Von Herrn Consul Emil Brass.

Herr Brass visited Korea in 1891.

Korea. *Bul. Soc. normande Geog.* **14** (1892): 384–418. **Long.**

La Corée ou Chôson (La terre du calme matinale). Par Colonel Chaillé-Long-Bey.

The first part of a general account of Korea including notes of a visit to the country.

Korea. *Mission Field* **38** (1893): 134–142. **Warner.**

A Journey of Exploration in Corea. By the Rev. L. O. Warner.

A boat journey from Seoul up the River Han and inland in 1892.

AFRICA.

African Railways. **Adams.**

Railroad Development in Africa. By Cyrus C. Adams. 8vo, pp. 15. *Map and illustrations. From the 'Engineering Magazine' (New York) for February. Presented by the Author.*

Congo-State. **Glave.**

Six Years of Adventure in Congo-Land. By E. J. Glave. With an Introduction by H. M. Stanley. London, Low & Co., 1893: large 8vo, pp. 247. *Illustrations. Price* 7*s.* 6*d.*

Congo-State—Mobangi. *Bul. Soc. Roy. Belge Geog.* **17** (1893): 5–41. **Marinel.**

La région du Haut-Ubangi ou Ubangi-dua. Par G. le Marinel.

The term "Haut Ubangi" is applied to the Mobangi between the rapids of Trongo (4° 21′ N.) at Yakoma and the confluence of the Boma and Welle.

Egypt. *Scot. Geog. Mag.* **9** (1893): 169–193. **Ross.**
Irrigation and Agriculture in Egypt. By Colonel Justin C. Ross, R.E.

Egyptian Civilisation. **Schweinfurth.**
Ueber Aegyptens auswärtige Beziehungen hinsichtlich der Culturgewächse. Von G. Schweinfurth. 8vo, pp. 22. *Presented by the Author.*

Egypt—Etbai. **Floyer.**
Etude sur le Nord-Etbai entre le Nil et la Mer Rouge. Par Ernest Ayscoghe Floyer. Avec quatre cartes et quinze illustrations. Le Caire Imprimerie Nationale, 1893: 4to, pp. x. and 192. *Presented by the Author.*

Eritrea. *Bol. Soc. Italiana* **6** (1893): 109–121. **Bettini.**
Itinerarii da Asmara verso Sud del cap. G. Bettini.

Tables of time occupied between successive points on a series of journeys southward from Asmara.

Eritrea. *Bul. Soc. Roy. Belge Geog.* **17** (1893): 42–74. **Haneuse.**
Notes sur l'Erythrée. Par le Capitaine L. Haneuse.

Record of a visit to Massowa and Asmara last winter.

Mobangi—Shari. *Bul. Soc. normande Geog.* **14** (1892): 217–247. **Nebout.**
La Mission Crampel. Par M. Albert Nebout. *With map.*

Nile. *Nature* **47** (1893): 464–467. **Lockyer.**
The Sacred Nile. By J. Norman Lockyer, F.R.S.

Tanganyika. *Bul. Soc. Roy. Belge Geog.* **17** (1893): 75–96. **Ursel.**
Les Belges au Tanganika. Par le Comte H. d'Ursel.

A tribute to the Belgian travellers who have assisted in the exploration of the Lake Tanganyika region.

NORTH AMERICA.

Appalachian Mountains. *Appalachia* 7 (1893): 63–67. ——
A Map of New England and Eastern New York, locating Prominent Summits. *With map.*

Historical Geography. **Winsor.**
The Anticipation of Cartier's Voyages, 1492–1534. By Justin Winsor, Cambridge, Mass. Wilson & Son, 1893: 8vo, pp. 14. *Maps. Presented by the Author.*

Mexico. **Parry.**
The Sacred Maya Stone of Mexico and its Symbolism. By Francis Parry. *With eight plates and numerous illustrations in the text.* London, Dulau & Co., 1893: Imp. 4to, pp. 90. *Price* 21*s. Presented by the Author.*

The author gives an interpretation of the symbolic sculpture of the Maya stone, with explanations of the method of decipherment.

United States—California. *Trans. Geog. Soc. Pacific* **3** (1892): 37–47. **Davidson.**
The Discovery of San Diego Bay. By George Davidson.

United States. **Woodburn.**
Causes of the American Revolution. By James A. Woodburn, PH.D. Baltimore, The Johns Hopkins Press, 1892: 8vo, pp. 64. *Price 50 cents.*

One of the Johns Hopkins University Studies in Historical and Political Science.

United States—Massachusetts. **Abbott.**
On the Geographical Distribution of Certain Causes of Death in Massachusetts. By Samuel W. Abbott, M.D.

The vital statistics of the State for the twenty years, 1871–1890, form the basis of this discussion, and the results are shown on a large number of maps.

CENTRAL AND SOUTH AMERICA.

Bakairi Language. **Von den Steinen.**

Zweite Schingú-Expedition 1887–88. Die Bakaïrí-Sprache. Wörterverzeichnis, Sätze, Sagen, Grammatik. Mit Beiträgen zu einer Lautlehre der Karaïbischen Grundsprache. Von Karl Von den Steinen. Leipzig, K. J. Koehler, 1892: 8vo, pp. xvi. and 403, *plate*. *Presented by the Author.*

Bolivia—Argentine Republic. **Oropeza.**

Limites entre la República de Bolivia y la República Argentina. Por Samuel Oropeza. Sucre, 1892: 8vo, pp. vi. and 287.

Chile. *Notes Soc. Scient. Chili. II.* (1892), pp. lii. lv. lx. **Reed.**

Solwe la Invasion de laugosta en Chile. By Edwyn C. Reed.

Notes on the geographical distribution of the *Acridium Paranense*.

Peru. **Markham.**

Latin-American Republics. A History of Peru, by Clements R. Markham, Chicago, C. H. Sergel & Co. London, Gay & Bird, 1892: 8vo, pp. xvi. and 556. *Maps and illustrations.*

POLAR REGIONS.

Antarctic Ice. **Fricker.**

Die Entstehung und Verbreitung des Antarktischen Treibeises. Ein Beitrag zur Geographie der Südpolargebiete von Dr. Karl Fricker. Mit einer Karte der antarktischer Eisverteilung. Leipzig, Rossberg'schers Hof-Buchhandung, 1893: 8vo, pp. 208. *Presented by the Author.*

AUSTRALASIA AND PACIFIC ISLANDS.

Hawaii, *Bull. Soc. Geog. Comm. Paris* **15** (1893): 66–79. **Ratard.**

Etude sur l'archipel Hawaiien; quelques problèmes economiques et sociaux en Hawaii. Par M. L. Ratard.

New Guinea. *Geog. Blätt.* **16** (1893): 20–66. **Oppel.**

Zur Landeskunde in Neu Guinea von A. Oppel.

An epitome of recent additions to our knowledge of New Guinea, including a list of published maps.

Samoa. **Jersey.**

Three Weeks in Samoa. By the Countess of Jersey. 8vo, pp. 27. *From the 'Nineteenth Century' for January and February*, 1893.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

Air and Soil Temperature. *Sitzungsb. Preuss. Akad. Berlin* (1893): 1139–78. **Bezold.**

Der Wärmeaustausch an der Erdoberfläche und in der Atmosphære. Von Wilhelm von Bezold. Erste Mittheilung. Einleitung—Allgemeine Sätze —Der Wärmeaustausch in Erdboden.

Americanists' Congress. ———

Congrès Internationale des Américanistes. Compte-Rendu de la huitième Session. Tenue a Paris en 1890. Paris, Leroux, 1892: 8vo, pp. 706.

This volume gives the Proceedings of the Congress of Americanists held at Paris last year, and contains portraits of the President M. Quatrefages de Bréau and of the late Ferdinand Denis. The papers published bear on I. History and Geography: (1) the name America, (2) History of Discovery, (3) latest researches regarding Columbus, (4) Cartography; II. Anthropology, III. Ethnography, IV. Archæology, V. Languages, VI. Palæography.

Astronomy. **Hopkins.**

Astronomy for every-day Readers. By B. J. Hopkins. London, G. Philip & Son, 1893: 12mo, pp. xv. and 102, *illustrations*. *Price* 1*s*. *Presented by the Publishers.*

Biographical Dictionary. **Lee.**

Dictionary of National Biography. Edited by Sidney Lee. Vol. xxxiv. Llwyd—MacCartney. London, Smith, Elder & Co., 1893: large 8vo, pp. vi. and 450. *Price* 15*s.*

The following names, more or less connected with geography and travel, appear among the notices in the present volume:—William Kennett Loftus, by G. S. Boulger; James Richardson Logan, by T. Seccombe; Michael Lok, by Prof. J. K. Laughton; Percival Barton Lord, by Gordon Goodwin; William Keast Lord, by H. M. Chichester; Louis Arthur Lucas, by Gordon Goodwin; William Lucas, by H. M. Chichester; Alfred Lyall, by the same; Robert Lyall, by Capt. S. P. Oliver; Sir Charles Lyell, by Prof. Grenville A. J. Cole; Henry Blosse Lynch, by H. M. Chichester; Thomas Kerr Lynch, by the same; and George Francis Lyon, by Prof. J. K. Laughton.

British Association. ——

Report of the Sixty-Second Meeting of the British Association for the Advancement of Science, held at Edinburgh in August 1892. London, John Murray, 1893: 8vo, pp. cvii. 944 and 119, *plates*. *Presented by the Association.*

Latitude Changes. *Comptes Rendus* **116** (1893): 476–478. **Gyldén.**

Sur la cause des variations périodiques des latitudes terrestres, par Hugo Gyldén.

The small periodical changes in latitude are explained by supposing great cavities to exist in the crust of the Earth, communicating with each other, and partly filled with mobile matter.

GENERAL.

Biography—Cabots. **Tarducci.**

R. Deputazione Veneta di Storia Patria. Di Giovanni e Sebastiano Caboto. Memorie raccolte e documentate da F. Tarducci. Venezia, 1892: large 8vo, pp. 429. *Presented by the Author.*

Commercial Geography. ——

Production and Distribution of the Principal Agricultural Products of the World. Compiled from official statistics U.S. Department of Agriculture. Division of Statistics. Miscellaneous Series, No. 5. Washington, 1893: 8vo, pp. 206.

This work compiled under the special charge of Mr. B. W. Snow is of very special value in presenting the agricultural statistics for ten consecutive years of ninety-two countries or colonies reduced to the same units and arranged in an orderly manner.

Explorational Mapping. ——

Hints on Reconnaissance Mapping for Explorers in Unsurveyed Countries. fo. pp. 8. *Presented by the Intelligence Division, War Office.*

France and its Colonies. **Levasseur.**

La France et ses Colonies (géographie et statistique). Par E. Lévasseur. 3 vols. Paris, C. Delagrave, 1890–93: 8vo, pp. (Vol. I.) xiv. and 556; (Vol. II.) 690; (Vol. III.) 512, *maps*, &c. *Presented by the Author.*

French Colonies. *Rev. Geog.* **32** (1893): 90–98, 178–189. **Thalamas.**

Les Colonies Françaises et la Géographie. A. Thalamas.

Geographical Societies. **Claparède.**

Annuaire Universel des Sociétés de Géographie. Par Arthur de Claparède, 1892–1893. Genève, H. Georg, 12mo., pp. xiv. and 71.

Maps. **Winchell and Winslow.**

The Size and Scale of Maps. A discussion by M. H. Winchell and Arthur Winslow. 8vo, pp. 12 [1893].

A review of the Missouri Geological Survey maps, followed by a correspondence between Prof. Winchell and Prof. A. Winslow.

Means of Communication. *Min. Proc. Inst. C.E.* **111** (1893): 1–40. **Hayter.**

Address of Mr. Harrison] Hayter, President, on assuming the chair for the first time after his election. With map of Euphrates Valley Railway.

This address deals with great engineering works in all parts of the world, which are likely soon to be undertaken.

Place Names. **Bonola.**

La Question des Noms Geographiques en Egypte. Par le Dr. Frédéric Bonola Bey. Le Caire, Imprimerie Nationale, 1893: 8vo, pp. 20. *Presented by the Khedivial Geographical Society.*

Place Names. **Köppen.**

Die Schreibung geographischer Namen. Vorschlag an den Deutschen Geographentag von 1893. Von Professor Dr. W. Köppen. Hamburg, 1890: 8vo, pp. 38. *Presented by the Author.*

Travel. **Matters.**

From Golden Gate to Golden Horn, and many other World Wide Wanderings, or 50,000 miles of Travel over Sea and Land. By Chas. H. Matters. Adelaide, Vardon H. Pritchard, 1892: 12mo, pp. 238, *portrait. Price* 1*s.* 6*d. Presented by the Author.*

The following works have also been added to the Library:—

British Islands. **Farnesi.**

Descriptio Britanniæ, Scotiæ, Hyberniæ, et Orchodvm, ex Libro Paoli Jovii, Episcopi Noger. De Imperiis, et Gentibvs cogniti Orbis, com eivs operis prohœmis, ad Alexandrvm Farnesivm Card. Ampliss. 8vo, pp. 125.

Biography—Broadfoot. **Broadfoot.**

The Career of Major George Broadfoot, C.B. (Governor-General's Agent N.W. Frontier, 1844–45), in Afghanistan and the Punjab. Compiled from his Papers, and those of Lords Ellenborough and Hardinge, by Major W. Broadfoot, R.E. London, John Murray, 1888: 8vo, pp. [20] and 445. *portrait and maps. Presented by the Author.*

Biography—Buddha. **Rockhill.**

The Life of the Buddha and the Early History of his Order. . . . Followed by Notices on the Early History of Tibet and Khoten. Translated by W. W. Rockhill. London, Trübner & Co., 1884: 8vo, pp. xii. and 273.

Burma. **Forchhammer.**

Papers on Subjects Relating to the Archæology of Burma. [E.] Forchhammer [PH.D.] Various sizes and dates. *Map and plates. Presented by the Secretary of State for India.*

Chinese-Japanese Dictionary. **Gubbins.**

A Dictionary of Chinese-Japanese Words in the Japanese Language. By John Harrington Gubbins. London, Trübner & Co., 1889: 3 vols., 12mo, pp. xviii. and [1198].

Guatemala. **Bastian.**

Königliche Museen zu Berlin. Steinsculpturen aus Guatemala, herausgegeben von A. Bastian, 1882: folio, pp. 30, *plates. Presented by Francis Parry, Esq.*

Guinea. **Snelgrave.**

A New Account of some Parts of Guinea, and the Slave Trade. . . . By Captain William Snelgrave. London, 1734; sm. 8vo, pp. 288. *Map.*

History. **Winsor.**

The Pageant of Saint Lusson, Sault Ste. Marie, 1671. An Address delivered at the Annual Commencement of the University of Michigan, Thursday, June 30, 1892. By Justin Winsor, LL.D. Ann Arbor, Mich., 1892: 8vo, pp. 34.

India *Great Trigonometrical Survey.* **Walker**

Synopsis of the Results of the Operations of the Great Trigonometrical Survey of India. Vol. v. Descriptions and Co-ordinates of the Principal and Secondary Stations and other Fixed Points of the Rahun Meridional Series, or Series E of the North-west Quadrilateral. By Colonel J. T. Walker. Dehra Dun, 1875: 4to, pp. 137. *Diagram and charts. Presented by the Secretary of State for India.*

Ditto. Vol. vi. The Jogi-Tila Meridional Series, or Series G and the Sutlej Series, or Series H of the North-west Quadrilateral. By Colonel J. T. Walker. Dehra Dun, 1875: 4to, pp. 42 and 62. *Diagram and Charts. Presented by the Secretary of State for India.*

Manuscript Troano. **Thomas.**

A Study of the Manuscript Troano, by Cyrus Thomas, PH.D., with an Introduction by D. G. Brinton, M.D. (*From 'Contributions to North American Ethnology,'* vol. v.) Washington, 1882: 4to, pp. xxxvii. and 237, *plates. Presented by Francis Parry, Esq.*

Mediterranean. **Michelot.**

Le Portulan de la Mer Mediterranée, ou le vrai Guide des Pilotes costiers. Dans lequel on verra la véritable maniere de Naviguer le long des Côtes d'Espagne, Catalogne, Provence, Italie, les Isles d'Yvice, Mayorque, Minorque, Corse, Sicile, and autres. . . . Le tout fidélement observé sur les Lieux. Par Henry Michelot. Amsterdam, 1754: 4to, pp. 160.

Morocco. **[Smith.]**

A Boy's Scrambles, Falls, and Mishaps in Morocco. 8vo, pp. 86. *Illustrations. Price* 1*s.*

New York—Indians. **Donaldson.**

Extra Census Bulletin. Indians. The Six Nations of New York, Cayugas, Mohawks (Saint Regis), Oneidas, Onondagas, Senecas, Tuscaroras. By Thomas Donaldson. Washington, D.C., 1892: 4to, pp. 89. *Maps and plates.*

Nismes. **Menard.**

Histoire des Antiquités de la Ville de Nismes et de ses Environs. Par M. Menard. New edition. Nismes, Gaude, 1822: 8vo, pp. 59. *Illustrations.*

Prussian Colonisation. **Schück.**

Brandenburg—Preussens Kolonial—Politik unter dem Grossen Kurfürsten und Seinen Nachfolgern (1647–1721). Von Dr. jur. Richard Schück. Mit einer Vorrede von Dr. jur. Paul Kayser. Leipzig, F. W. Grunow, 1889: 2 vols., pp. (Vol. I.) xxxi. and 406; (Vol. II.), xii. and 602.

Salvador. **Barberena.**

Descripcion Geografica y Estadistica de la República de El Salvador. Por el Doctor Santiago J. Barberena. San Salvador, 1892: large 8vo, pp. 114.

Switzerland. **Forbes.**

A Physician's Holiday; or a Month in Switzerland in the Summer of 1848. By John Forbes, M.D., F.R.S. Second edition. London, John Murray, 1850: 8vo, pp. xii. and 350, *Map and illustration.*

Udânavarga. **Rockhill.**

Udânavarga; a Collection of Verses from the Buddhist Canon. Compiled by Dharmatrâta. Being the Northern Buddhist Version of Dhammapada. Translated from the Tibetan of the Bkah-hgyur. With Notes and Extracts from the Commentary of Pradjnavarman. By W. Woodville Rockhill. London, Trübner & Co., 1883: 8vo, pp. xvi. and 224.

Uruguay. **Murray.**

Travels in Uruguay, South America; together with an Account of the Present State of Sheep-farming and Emigration to that Country. By the Rev. J. H. Murray, B.A. London, Longmans & Co., 1871: sm. 8vo, pp. viii. and 234. *Map and illustrations.*

NEW MAPS.

By J. COLES, *Map Curator*, R.G.S.

EUROPE.

England and Wales. **De Rance.**

County Councils of England and Wales Map of River Basins in County Groups, defining the Natural Jurisdiction of Joint Committees of County Councils for the Prevention of Pollution of Rivers under Section 14 (III.) of the Local Government Act, 1888, and other matters requiring united control. By C. E. De Rance, Assoc. Inst. C.E., F.G.S., &c. Scale 1 : 1,014,700, or 13·9 geographical miles to an inch. Manchester, J. E. Cornish, 1893. *Price* 3*s.* 6*d.* *Presented by the Author.*

The purpose for which this map has been published is clearly set forth in its title. It is printed in colours, all rivers being shown in blue, and the water-partings in red. The boundaries of the County Councils are indicated by black lines, and only the principal towns in each division are shown.

England and Wales. **Ordnance Survey.**

Publications issued since March 12th, 1893.

1-inch—New Series :—

ENGLAND AND WALES: 297, engraved, 1*s.*; 208–225, hills photo-zincographed in brown, 1*s.* each.

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ENGLAND AND WALES: **Lancashire**, 5, 7, 8, 11, 2*s.* 6*d.* each; 27, 28, 2*s.* each; **Yorkshire**, 122, N.W., 123, S.E., 1*s.* each.

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ENGLAND AND WALES: **Lancashire**, XX. 6, 10, XXXVIII. 16, XLIV. 9, 4*s.* each; 11, 5*s.*; 13, XLV. 9, 11, 13, 14, 16, LIV. 1, LVIII. 12, LIX. 2, 6, 9, 4*s.* each; 13, 5*s.*; LXXXVIII. 14, 16, 4*s.* each; XCVI. 1, 4, 5*s.* each; 8, 11*s.* 6*d.*; 9, 8*s.*; 12, 4*s.*; 13, 5*s.*: 14, 14*s.*; 16, 5*s.*; XCIX. 1, 5*s.*; 5, 8*s.*; CIII. 4, 8*s.*; CIV. 2, 9, 14*s.* each; CVII. 2, 4*s.*; 5, 5*s.*; CVIII. 13, 4*s.*; CXIV. 1, 5*s.*; 6, 4*s.* (coloured). **Yorkshire**, LIV. 5, LV. 9, LXXIII. 15, LXXXIX. 3, 6, 7, 11, 4*s.* each; 14, 3*s.*; 15, XC. 12, CXL. 16, CLVII. 7, CLVIII. 2, CLXXXVII. 11, 4*s.* each; 13, 5*s.*; CCIV. 3, 4, 6, 8, 4*s.* each; 11, 5*s.*; 12, 14, 16, 4*s.* each; CCXVII. 11, 5*s.*; 12, 15, 4*s.* each; CCXXVI. 14, 14*s.*; CCLXXV. 14, 5*s.*; CCLXXXII. 1, 3, 4*s.* each; 4, 5*s.*; 6, 11, 4*s.* each; 16, 5*s.* (coloured).

Town Plans—10-feet scale :—

ENGLAND AND WALES: **St. Helens** (Lancashire), CI. **13**, 7, 5*s.*; CVIII. **1**, 8, 8*s.*; 19, 5*s.*; CVIII. **6**, 1, 5*s.* (coloured). **Whitby** (Yorkshire), XXXII. **3**, 23, 3*s.*; XXXII. **7**, 3, 5*s.*; 6, 5*s.*; 7, 8*s.*; 8, 5*s.*; 12, 5*s.*: 13, 5*s.*; 17, 5*s.* (coloured).

(*E. Stanford, Agent.*)

Holland. **Geest.**

Het Koninkrijk der Nederlanden. Naar de Topografische kaart (1 : 50,000) en andere nieuwe bronnen ontworpen en geteekend door E. de Geest, Lithograaf. Amsterdam, Seyffardt's Boekhandel, 1893. Scale 1 : 300,000 or 4·1 geographical miles to an inch. *Price f.* 4.

This map is taken from the large Government Survey of 1 : 50,000, and other recent sources. All means of communication are laid down, and it is a very useful map for purposes of general reference.

Norway. **Norges Geografiske Opmaaling.**

Generalkart over det sydlige Norge i 18 Blade. Scale 1 : 400,000, or 5·5 geographical miles to an inch. Sheet X.—Topografisk kart over kongeriget Norge. Scale 1 : 100,000, or 1·3 geographical miles to an inch. Sheets: 5 B. Grimstad; 6 B. Jæderen; 30 B. Bygdin; 31 D. Söndre Fron; 42 B. Kvikne; 43 A. Röros; 45 C. Bratvær; 52 D. Uren; 57 A. Fröiningsfjeld.—Norges Geologiske Undersögelse. Scale 1 : 100,000, or

1·3 geographical miles to an inch. Sheet: Selbu.—Geologisk Kart over Tromsø Amt i Generalkartets Maalestok. Scale 1:400,000, or 5·5 geographical miles to an inch. Af Karl Pettersen, 1890. Norges geografiske Opmaaling. Kristiania, 1891. *Presented by the Norwegian Geographical Institute, Christiania.*

Scotland. **Inglis.**

The "Half Inch" Map of Scotland: Fife, Forfar and East Perth District. Edited by H. R. G. Inglis. Scale 1: 126,720, or 1·7 geographical miles to an inch. Gall and Inglis, Edinburgh and London. *Price* 1*s. Presented by the Publishers.*

This map is well suited for the use of tourists. The main roads are coloured, and the cross roads, lanes, and footpaths are marked, parks, villages, railway stations, &c., are also shown.

ASIA.

Indian Government Surveys. **Surveyor-General of India.**

Indian Atlas, 4 miles to an inch. Sheet No. 94, Parts of Districts Khamet (Nizam's Dominions), of Kistna, Godavari and Vizagapatam (Madras Presidency) and Bastar State (Central Provinces). Quarter Sheets No. 35, S.W. Parts of Native States, Oodeypore, Dungarpur, Banswara and Partabgarh (Rajputana), and of Mahi Kantha Agency (Bombay Presidency). No. 114, S.W. Parts of Districts Singhbhum; Bonai (Tributary State, Chota Nagpur), Keonjhar and Mayurbhanja (Tributary States, Orissa).—India, showing railways, corrected up to March 31st, 1892, 1 inch to 96 miles.—India, showing telegraphs, corrected up to March 31st, 1892, 1 inch to 96 miles. Punjab Survey, 1 inch to a mile. Sheet No. 117, Districts Jhang and Dera Ishmail Khan. Seasons 1879 to 81 and 1888–89. Sheet No. 234, Kapurthala State. Seasons 1885–86. Sheet No. 236, Districts Jullundur and Ferozepore, and Kapurthala State. Seasons 1884 to 87. Sheet No. 254, District Ludhiana and Sikh States. Seasons 1887–88 and 1890–91. Sheet No. 255, District Karnal, and Sikh States. Seasons 1887–88 and 1888 to 90. Sheet No. 294. (2nd edition), Districts Umballa and Karnal. Seasons 1870–72 and 1887–88.—Bombay Survey, 1 inch to a mile. Sheet No. 330, District Bijapur. Seasons 1889–91.—Lower Burma Survey, 1 inch to a mile. Sheet No. 567 and portion of No. 583, District Mergui. Seasons 1889–91. Sheet No. 568 and portion of No. 584, District Mergui. Seasons 1889–91.—Upper Burma Survey. Portion of Coalfield's Tract, Upper Chindwin District. Surveyed, Season 1891–92, 1 inch to a mile.—North Eastern Frontier, 1 inch to 8 miles. Sheet No. 15 (2nd edition). Parts of Districts Sylhet, Cachar Khasi Hills, Jainthia Hills and Naga Hills (Assam), and Upper Chindwin (Burma), of Native States Manipur (Assam), Hill Tipperah (Bengal) and of Lushai Hills.—South Eastern Frontier, 1 inch to 4 miles. Sheet No. 1 N.W. (2nd edition). Parts of Chittagong Hill Tracts, Hill Tipperah (Bengal), Lushai and Chin Hills. Map of the Gorakhpur Division, prepared in accordance with Government N.W.P., P.W. Department. Circular No. E, dated May 16th, 1872. Brought up to December 31st, 1891, 1 inch to 4 miles. 2 Sheets.—Map of Kamoun Division, prepared in accordance with Government N.W.P., P.W. Department. Circular No. E, dated May 16th, 1872, revised up to January 1891, 1 inch to 4 miles. 4 Sheets.—Map of the Rohilkhand Division, prepared in accordance with Government N.W.P., P.W. Department. Circular No. E, dated May 16th, 1872, revised up to January, 1891, 1 inch to 4 miles, 4 sheets.—District Benares, 1882–84, published May 1892. 3 Sheets, 1 inch to 2 miles.—District Basti 1883–88, 1 inch to 2 miles, published June 1892. 4 sheets.—District Sylhet, 1 inch to 4 miles. With additions and corrections up to October 1891.—Parts of Jeypore, Jodhpore, Kishengurh and Tonk States, 1 inch to 4 miles. No. IV, Degree Sheet, Rajputana Survey, February 1870, with addition of railway up to March 1892.—Chart of Triangulation embracing the field of operations of the Lushai Column.—Lushai Expeditionary Force, 1889–90, 1 inch to 4 miles.—No. 2, Preliminary Chart of the Principal Triangulation of the Mandalay Series. Season 1891–92, 1 inch to 4 miles. *Presented by H.M. Secretary of State for India, through India Office.*

Japan. **Supan.**

Verteilung der Erdbeben in Japan, 1885–1889. Von Alexander Supan, Verbreitung der Erdbeben, 1885–1889. Verbreitung der Starken Erdbeben, 1885–1889. *Petermann's Geographische Mitteilungen.* Jahrgang 1893. Tafel 2. Gotha, Justus Perthes. *Presented by the Publisher.*

AFRICA.

Algeria. **Service Géographique de l'Armée, Paris.**

Carte topographique de l'Algérie. Scale 1:50,000, or 1·4 inches to a geographical mile. Service Géographique de l'Armée, Paris. Sheets:—No. 27, Taza; No. 80, Oued Kramis: No. 209, Aïne Temouchent. *Price 1 fr. 50 cents. each sheet.*

Angola. **Commissão de Cartographia, Lisbon.**

Carta de Angola, 1892. Scale 1:3,000,000, or 41·6 geographical miles to an inch. Commissão de Cartographia, Lisbon. *Presented by the Commissão de Cartographia.*

Great care has evidently been taken in the preparation of this map to bring it up to date. The railways in operation, and proposed, are shown; the heights of many places are given in metres, and the importance of towns and villages is indicated by symbols. In one corner of the map there is a table of the administrative divisions of the province, and of the districts into which each of them is again divided.

AMERICA.

Ecuador. **Wolf.**

Carta Geográfica del Ecuador por Dr. Teodoro Wolf, publicada por órden del Supremo Gobierno de la República y trabajada bajo las Presidencias de los E. E. Señores, Dr. D. J. M. Plácido Caamaño y Dr. D. Antonio Flores. 1892. Istituto geográfico de H. Wagner y E. Debes en Leipzig. Scale 1 : 445,000, or 6·2 geographical miles to an inch.

The absence of any reliable map of Ecuador has been greatly felt, and as Dr. Wolf has been twenty years in the country, and has used (with the exception of Mr. E. Whymper's work) all the reliable material obtainable, there is every reason to believe that the map he has produced is as accurate as can be expected, the country never having been properly surveyed. As regards the western portion of the republic, a very large amount of detail is given, while the eastern part is shown on an inset with a reduced scale. Among the authorities consulted by Dr. Wolf are Velasco, Humboldt, British Admiralty Charts, Wisse, Witt, Wilson, Reiss and Stübel, Cevallos, Codazzi, Raimondi and others. In one corner of the map a table is given containing the altitudes of mountains, cities, &c., above sea-level. These for the most part are taken from the lists of Reiss and Stübel. There is a considerable difference between some altitudes given on this map and the result of Mr. E. Whymper's observations; this is to be regretted, as no explorer has taken more pains to arrive at the truth, or, indeed, has been more competent to do so.

The map has been produced by Wagner and Debes of Leipzig in a very creditable manner. The hill-shading is in brown and the water in blue; and taken altogether, it is a very effective map. The Galapagos Group is shown on an inset, and a table of the territorial divisions of the Republic is given.

Accompanying the map is a work on the physical geography and geology of Ecuador.

United States. **Appalachian Mountain Club.**

Map of New England and Eastern New York, showing the position of such Prominent Summits of the several Regions as have been accurately located and published. Scale 1 : 1,000,000, or 13·6 geographical miles to an inch. From *Appalachia*, vol. vii., No. 1, February, 1893. Boston, Appalachian Mountain Club.

AUSTRALASIA.

Australasia. **Behr.**

Neueste Karte von Australien. Mit Neu-Guinea, Kaiser-Wilhelms-Land, Bismarck-Archipel, den Sunda-Inseln, Siam und Annam, Neu Seeland

und sämtlichen Inselgruppen des Grossen Oceans, nebst den Dampfer- und Telegraphen-Verbindungen und einem orographischen Kärtchen. Für die Bedürfnisse des Handels und der Verkehrsanstalten sowie für den Unterricht an Lehranstalten bearbeitet von Prof. Fr. Behr. Scale 1 : 12,500,000, or 171·2 geographical miles to an inch. Stuttgart, Verlag von Julius Maier, Separat Konto Fr. Doerr.

Australia. **Lindsay.**

Map showing the Explorations and Discoveries in South Australia and Western Australia, made by the Elder Scientific Exploring Expedition, originated and equipped by Sir Thomas Elder, G.C.M.G., F.R.G.S., under the auspices of the South Australian and Victorian branches of the Royal Geographical Society of Australasia, commanded by David Lindsay, F.R.G.S., Memb. S. A. I. Surv., 1891-2. Compiled and drawn by D. Lindsay and L. A. Wells. Scale 1 : 975,000, or 13·3 geographical miles to an inch. Surveyor-General's Office, Adelaide. *Presented by Sir Thomas Elder, G.C.M.G., F.R.G.S.*

GENERAL.

German Colonies. **Langhans.**

Deutscher Kolonial-Atlas, 30 Karten mit vielen Hundert Nebenkarten entworfen, bearbeitet und herausgegeben von Paul Langhans. Zweite Lieferung: Nr. 4, Das Deutsche Land. Nr. 24, Schutzgebiet der Neu Guinea-Kompanie, Blatt 1. Dritte Lieferung: Nr. 27, Schutzgebiet der Neu Guinea-Kompanie, Blatt 4. Nr. 29, Schutzgebiet der Neu Guinea-Kompanie, Blatt 6. Gotha: Justus Perthes, 1893. *Price* 1 *m.* 60 *pf. each part.*

These are the second and third issues of an atlas of the German colonies, the first part of which was noticed in the January number of *The Geographical Journal*. The maps have been carefully brought up to date, and are very nicely drawn.

Meteorological. **Zenker.**

Die Jahrestemperaturen des Luft über den Oceanen und Binnenmeeren in ihren Abweichungen von den Formel: $\vartheta = I. - 30°$ C. Von Dr. W. Zenker. *Petermann's Geographische Mitteilungen*, 1893. Tafel 4. Gotha, Justus Perthes. *Presented by the Publisher.*

The World. **Johnston.**

W. & A. K. Johnston's Royal Atlas of Modern Geography. Edition in monthly parts. Part 17. W. & A. K. Johnston, Edinburgh and London, 1893. *Price* 4*s.* 6*d.* each part. *Presented by the Publishers.*

This part contains a map of Palestine, reduced by arrangement with the Committee of the Palestine Exploration Fund, and embodying as much of Western and Eastern Palestine as the scale on which it is drawn allows; an inset plan of Jerusalem is also given. The other is the south-east sheet of a four-sheet map of the United States, with inset plans of New York and its environs, and the City of Washington.

The World. **Andree.**

Richard Andree's Allgemeiner Handatlas in hundertvierzig Kartenseiten, nebst alphabetischen Namenverzeichnis. Dritte völlig neubearbeitete, stark vermehrte Auflage, herausgegeben von der Geographischen Anstalt von Velhagen und Klasing in Leipzig. Parts 1 to 27. *Price* 50 *pf. each.*

These form part of the third German edition of this atlas, which, when complete, will contain 140 sheets of maps. It is the intention of the publishers to issue the numbers at intervals of from eight to fourteen days, by which means the complete atlas will be in the hands of subscribers before the end of the present year. In the prospectus, that accompanies the present issues, it is stated that nearly half of the maps will be entirely new, and all of them with reference to Germany will be drawn on an uniform scale.

The World. **Cassell.**

The Universal Atlas, containing 117 pages of Maps, and an Alphabetical Index of 125,000 Names. Published for the Atlas Publishing Co., Limited, by Cassell & Co., Limited. London, 1893. *Price* £1 10*s.*

This atlas is now complete.

The World. **Vidal-Lablache.**

Atlas Vidal-Lablache, Maitre de Conférences de Géographe a l'École Normale Supérieure. Histoire et Géographie. 137 Cartes—248 Cartons. Index alphabétique de plus de 40,000 noms. (L'Atlas complet paraîtra en 24 livraisons.) 19e Livraison. Paris: Armand Colin & Cie., Éditeurs. 1893. *Price* 1 *fr.* 25 *cents each part.*

The present issue of this atlas contains maps of South America; the conquests of Russia, during the present century in Central Asia; French conquests in Algeria; Africa in 1870, showing the territory which has come within the spheres of influence of Europeans since that date; Australia, on a very small scale; North and South polar maps; The World in hemispheres orographically coloured; a set of maps showing the zones of vegetation, principal races, and religions of the world; currents and climates; Western Asia; Eastern Asia. As usual with this atlas, explanatory notes are given with each map.

CHARTS.

Admiralty Charts. **Hydrographic Department, Admiralty.**

Charts and Plans published by the Hydrographic Department, Admiralty. January and February, 1893. *Presented by the Hydrographic Department, Admiralty.*

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32	m	=	4·0	England, south coast:—Falmouth Harbour. 2*s.* 6*d.*
2567	m	=	4·0	England, east coast:—Tees Bay. 2*s* 6*d.*
1645	m	=	0·55	Asia Minor:—Island of Khios and Gulf of Smyrna (plans, Port Scio or Kastro. Port Sahib.) 2*s.* 6*d.*
1734	m	=	1·0	Newfoundland, east coast:—St. Julien Island to Hooping Harbour, including Canada Bay (plan, Great Goose and St. Julien Harbours). 2*s.* 6*d.*
1651	m	=	0·5	North America, east coast:—Nova Scotia, Prince Edward Island, and part of New Brunswick. 3*s.*
922	m	=	2·0	British Columbia:—Burrard Inlet. Vancouver harbour. Second Narrows. 2*s.* 6*d.*
	m	=	4·0	
1711	m	=	0·25	Bay of Bengal, Orissa coast:—Narsapur River to Bimlipatam (plan, Coringa or Cocanada Bay). 2*s.* 6*d.*
1680	m	=	0·75	British North Borneo:—Darvel Bay. (Preliminary Chart). 3*s.*
1681	m	=	0·75	British North Borneo:—Northern shore of Sibuko Bay. (Preliminary Chart). 3*s.*
2194	m	=	various	Eastern Archipelago:—Sketch plans of anchorages in the northern part of Celebes.—Bolang Uki Bay, Amurang Bay. Bolang Bangka Point to Moriri Point. Dondo Point to Cape Besar, including Kwandang Bay. Domisil Bay. Kema Road. Sumalata Road. Himana Cove, anchorages at Kaidipan and Bolang Itam. Muton Road. Kora Kora Inlet. Pienchang Bay. Buwul Road. Paleli Bay. Parigi Road. Kota Buna Road. Belang Bay. 1*s.* 6*d.*
2195	m	=	various	Eastern Archipelago:—Sketch plans of anchorages in the eastern part of Celebes. Tambu Bay. Ampat Islands Anchorage. Taliboi Road. Bunta Bay. Buah Lemo Road. Nona Petong Bay. Bangkalang Bay. Bangaai Bay. Tomori Gulf. Sakita Road. 1*s.* 6*d.*
2196	m	=	various	Eastern Archipelago:—Sketch plans of anchorages in the southern part of Celebes. Wowoni Strait and Channel to Kendari Bay. Lepana Islands Channel. Lohia Bay. Labuan Balanda. Buton Road. 1*s.* 6*d.*
2738	m	=	1·25	Cochin to Cape Comorin:—Plan added. Minikoi Island.

(*J. D. Potter, Agent.*)

CHARTS CANCELLED.

No.		Cancelled by—		No.
32	Falmouth Harbour ..	New plan.	Falmouth Harbour ..	32
2567	Tees Bay	New plan.	Tees Bay.	2567
1645	Khios Island and Strait	New chart.	Island of Khios and	
1523	Gulf of Smyrna ..		Gulf of Smyrna	1645
286	Plan of Canada Bay	New chart.	St. Julien Island to	
	on this Chart ..		Hooping Harbour..	1734
71A	Coromandel Coast.	New Chart.	Narsapur River to	
	Sheet 1.		Bimlipatam	1711
1257	Ping Yang Inlet.			

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS:

No. 121, Sweden, south-west coast:—Koster Islands and approaches to Strömstad. 156, Sweden, south-west coast:—Mäseskär to Hållö. 2296, Gulf of Bothnia:—South Quarken to Hornsland. 2302, Gulf of Bothnia:—Tome Point round the head of the Gulf of Tauvö. 2690, France, west coast:—Brest Roadstead. 77, Spain, north coast:—Gijon Bay, Barquero entrance, San Ciprian Bay and Port. 1131, Mediterranean:—Island of Corsica. 160, Mediterranean:—Civita Vecchia to Policastro. 1189, Mediterranean:—Bonifacio Strait. 161B, Mediterranean:—Sardinia Island, northern part. 2836A, Mediterranean:—Grecian Archipelago, southern part. 1817, Mediterranean:—Siphano, Serpho, Thermia, and Jura Islands. 2399, Black Sea:—Pyrgos or Burghaz Gulf. 2843A, North America, east coast:—Chesapeake Bay. 1577, Africa, east coast:—Lower Zambesi and Shiré Rivers. 827, India, west coast:—Vengurla to Cape Comorin. 2737, India, west coast:—Viziadrug to Cochin. 975, Philippine Islands:—Port Kavite. 2375, Australia, north-east coast:—Torres Strait western channels. 2459, Pacific Ocean:—North-west Pacific Ocean. 1570, Pacific, New Hebrides Islands:—Malo Island to Efate Island. 1378, Sandwich Islands:—Honolulu Harbour. (*J. D. Potter, Agent.*)

French Charts. **Service Hydrographique de la Marine.**

No. 4657, Ports et Mouillages dans le Détroit de Magellan, 1892. 4629, Océan Pacifique, Iles Galapagos, Ports et Mouillages, 1892. 4595, Corse, Environs de Bonifacio, du Cap Feno à Santa Manza, 1892. 4656, Golfe de Bénin, Kotonu, Porto-Novo, Uémé, 1892. *Presented by the Service Hydrographique de la Marine, Paris.*

Norwegian Charts. **Norges Geografiske Opmaaling.**

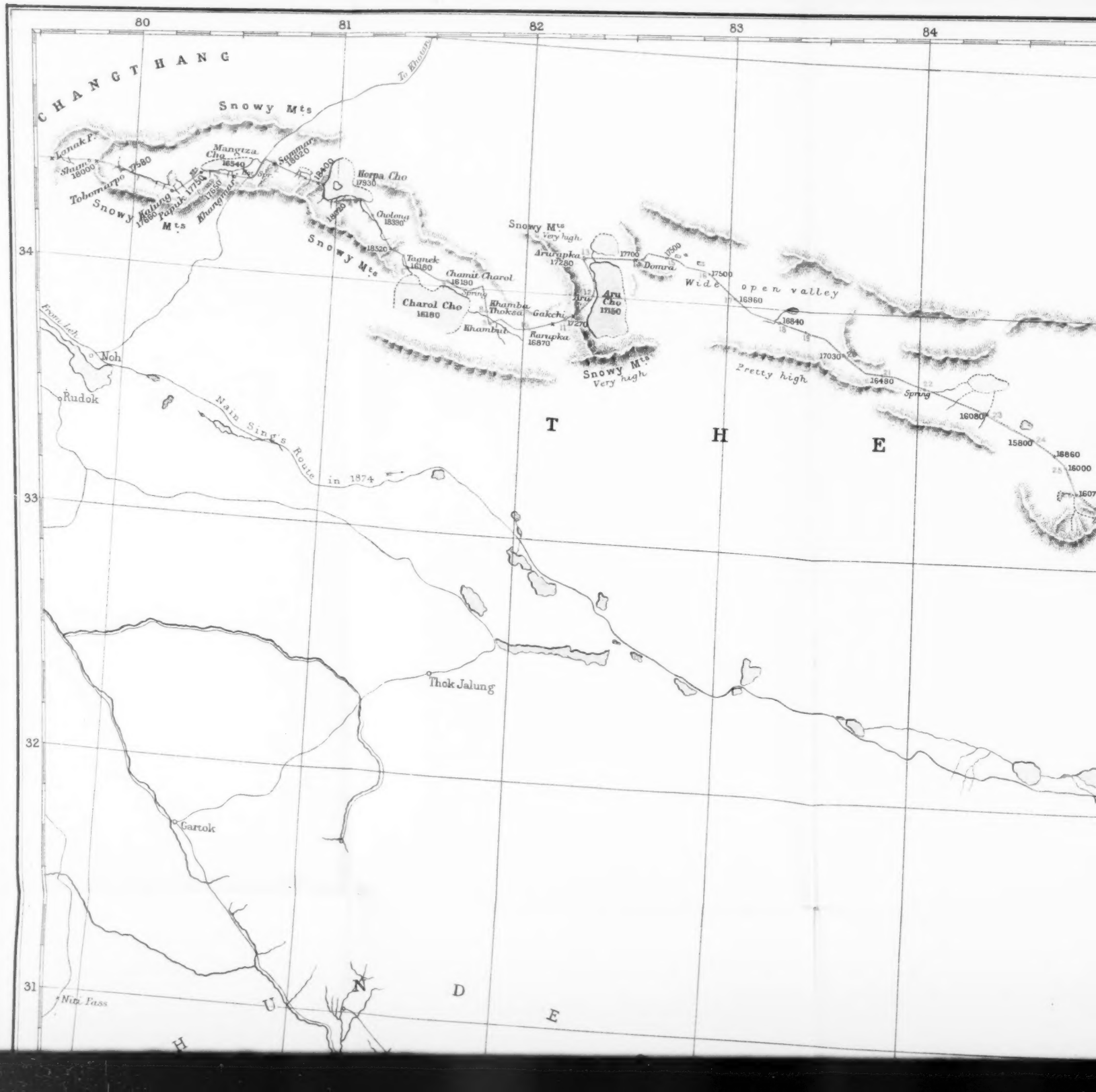
Generalkart over den Norske Kyst fra Smölen med Trondhjemsleden til Vikten, 1892. Scale 1:200,000, or 2·7 geographical miles to an inch. Specialkart over den Norske Kyst fra Jomfruland til Sildeodden. Specialkart B, 6. Specialkart over den Norske Kyst fra Sildeodden til ytre Torungen. Specialkart B, 7. Specialkart over den Norske Kyst fra Ogne til Jæderens Rev. Specialkart B, 14. Specialkart over den Norske Kyst fra Terningen til Grundene. Specialkart B, 42. Specialkart over den Norske Kyst fra Dolmsund til Lyngvær. Specialkart B, 45. Norges Geografiske Opmaaling, Kristiania. *Presented by the Norwegian Geographical Institute.*

North Pacific. **Krümmel.**

Verteilung des Salzgehalts im Nordpacifischen Ozean. Von Prof. Dr. O. Krümmel. *Petermann's Geographische Mitteilungen*, Jahr. 1893. Gotha, Justus Perthes. *Presented by the Publisher.*

PHOTOGRAPHS.

N.B.—It would greatly add to the value of the collection of Photographs which has been established in the Map Room, if all the Fellows of the Society who have taken photographs during their travels, would forward copies of them to the Map Curator, by whom they will be acknowledged. Should the donor have purchased the photographs, it will be useful for reference if the name of the photographer and his address are given.


80
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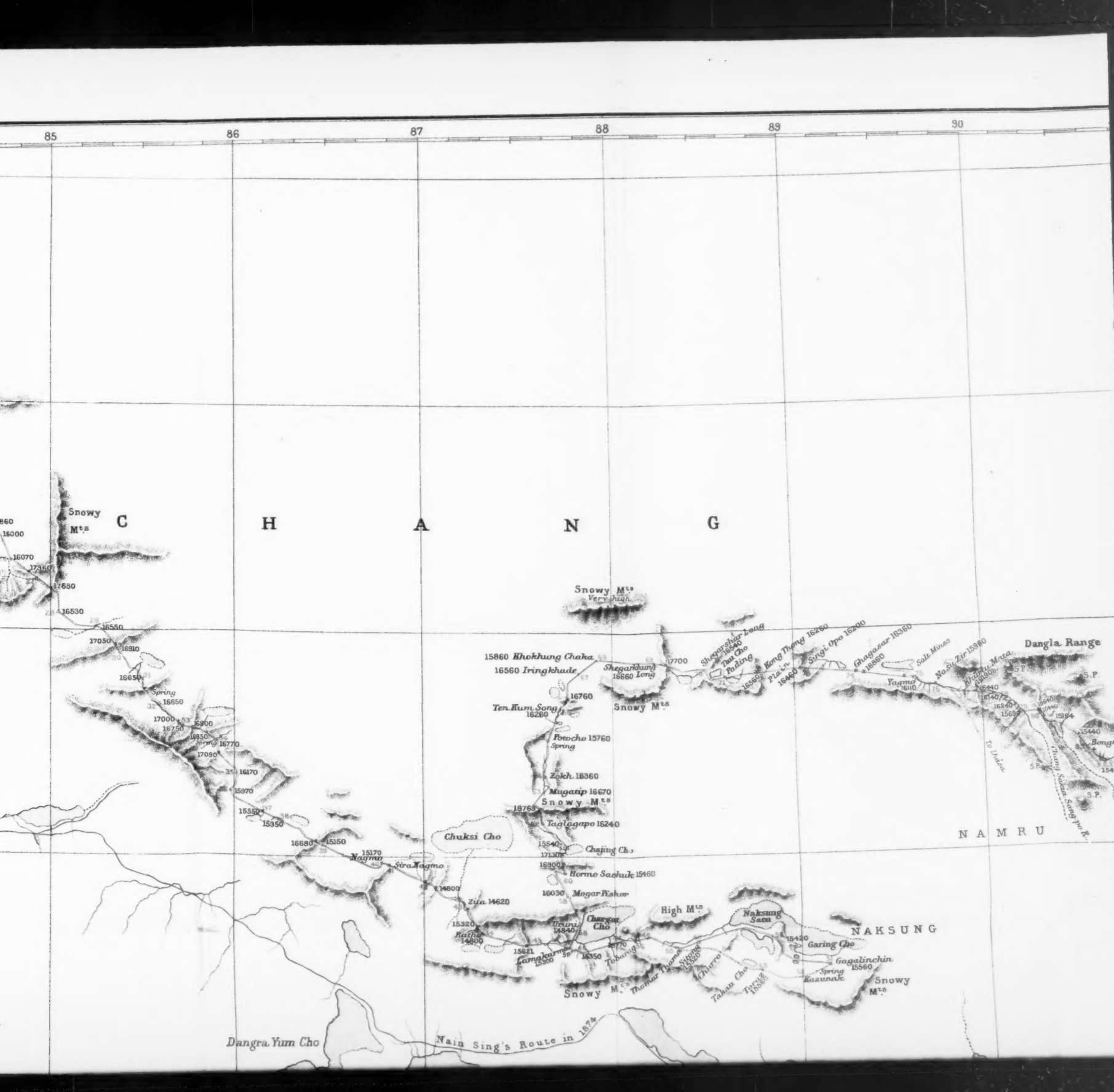
CHANGTHANG
Snowy Mts
To Rudok
Lenak F.
Shan
16000
17580
Tobumarpo
Kalung
16660
Papuk
17750
Kharpinak
17650
Mangtza Cho
16540
Sangmar
16820
18400
Korpa Cho
17930
Snowy Mts
18520
Chulung
18390
Snowy Mts
Very high
Arurapka
17280
17700
To Domra
17500
Wide open valley
16960
16840
17030
16480
Spring
16080
15800
16860
16000
Tagnek
16180
Chamit Charol
16180
Spring
Charol Cho
16180
Khamba Thokea
Gakchi
17270
Khambait
Arurapka
16870
Aru Cho
17150
Snowy Mts
Very high
Pretty high
From Leh
Noh
Rudok
Nain Sing's Route in 1874
T H E
Thok Jalung
Gartok
Nia Pass
H U N D E


85
86
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89
90
C H A N G
Snowy Mts
Snowy Mts
Very high
15860 Khokhung Chaka
16560 Iringkhade
Shegarkhung Long
16660
17700
Shegarshar Leang
16640
Tsar Cho
Poding
16560
Long Thang 16260
Plain
16450
Sungi Opo 16200
Ghagasar 16360
18860
Salt Mines
Yagma
16110
Nagtu Zar 15960
Khatsu Maga
15980
Dangla Range
S.P
16760
Ten Tum Song
16260
Snowy Mts
Potocho 15760
Spring
Zokh 16360
Mugatip 16670
Snowy Mts
18765
Taglagapo 18240
Chuksi Cho
15540
Chajing Cho
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16900
Hormo Sachuk 15460
16030
Magar Rishar
Zua 14620
14800
Naymo
Sira Nagmo
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Bongra
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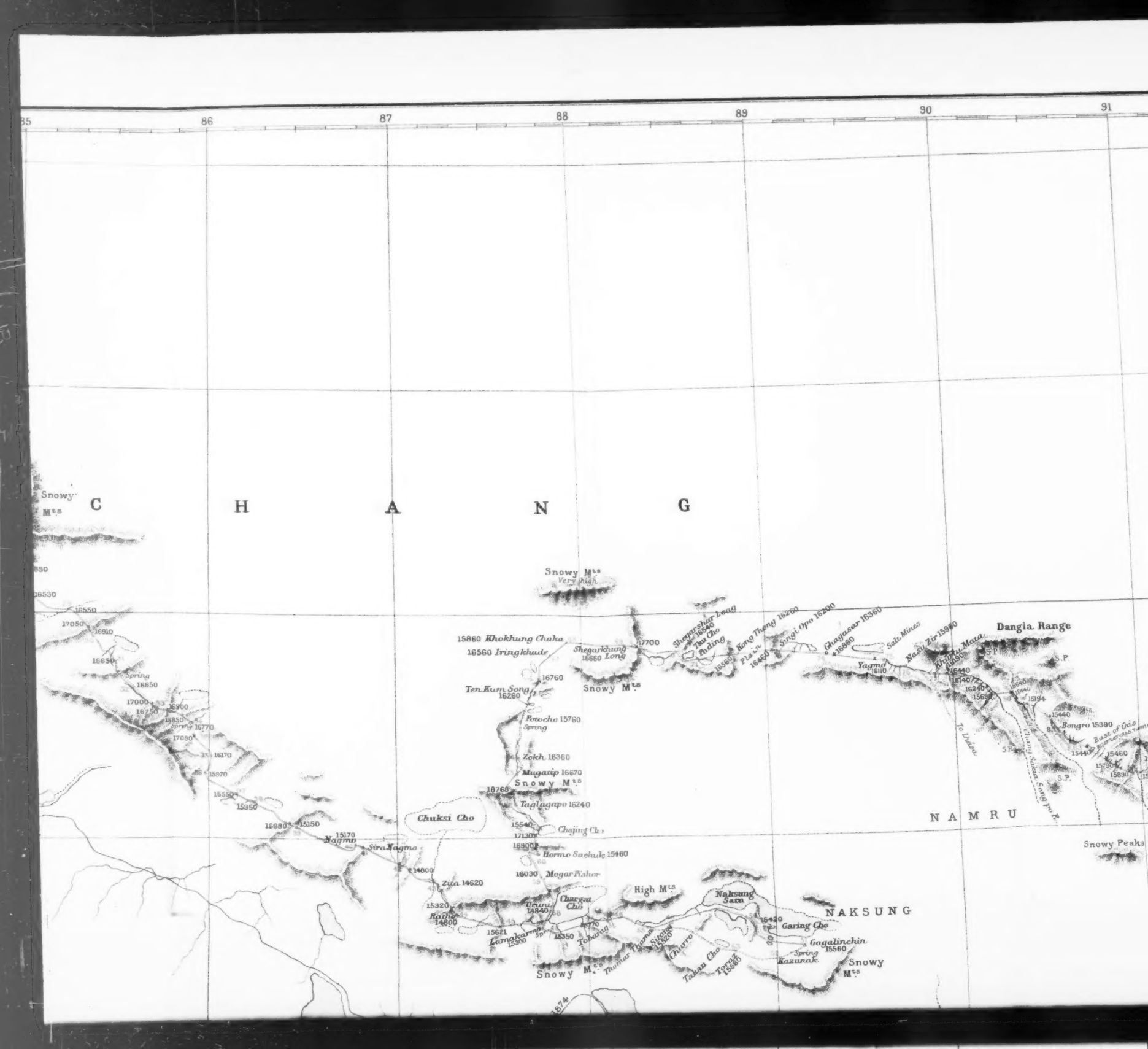
Chung Sakya Sarey pu R.
NAMRU
Sn
High Mts
Naksung Sam
NAKSUNG
Garing Cho
15420
Gagalinchin
15560
Spring
Kazunak
Snowy Mts
Urung
14840
Chargut Cho
15320
Rauma
14800
15621
Lamakarma
15300
15350
Tobung
15770
Thamar
Thama
15820
Churro
Takau Cho
15565
Tsuga
Snowy Mts
Dangra Yum Cho
Nain Sing's Route in 1874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C H A N G
Snowy Mts
Snowy Mts
Very High
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16560 Iringkhade
Shegarkhung Long
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Snowy Mts
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Ten Rum Song
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Potocho 15760
Spring
Zokh 16360
Mugarip 16670
Snowy Mts
16765
Taglagapo 16240
Chuksi Cho
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Chajing Ch
16900
Hormo Sachuk 15460
16030 Mogar Kshor
Zila 14620
Nagmar
Sira Nagmo
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Rathe
14800
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Lumakarma
15390
Sp
15350
Tobarma
16770
Thomar Tsanda
15820
Chierro
Takan Cho
Torgo
15560
Snowy Mts
Thomar Tsanda
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Chierro
Takan Cho
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Snowy Mts
Shegarshar Long
16540
Thu Cho
Pading
16560
Long Thang 16260
Plain
16460
Singi Opo 16200
Ghagasar 16360
16860
Salt Mines
Nasu Zir 15980
Yagma
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Khimbu Mata
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Bongro 15380
East of Dzo's
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15830
S.P
S.P
To Lhdeu
Thurgi Sakya Song
Dangla Range
NAMRU
Snowy Peaks
High Mts
Naksung Sam
NAKSUNG
15420
Garing Cho
Gogalinchin
15560
Spring
Kazunak
Snowy Mts
16550
17050
16810
16650
Spring
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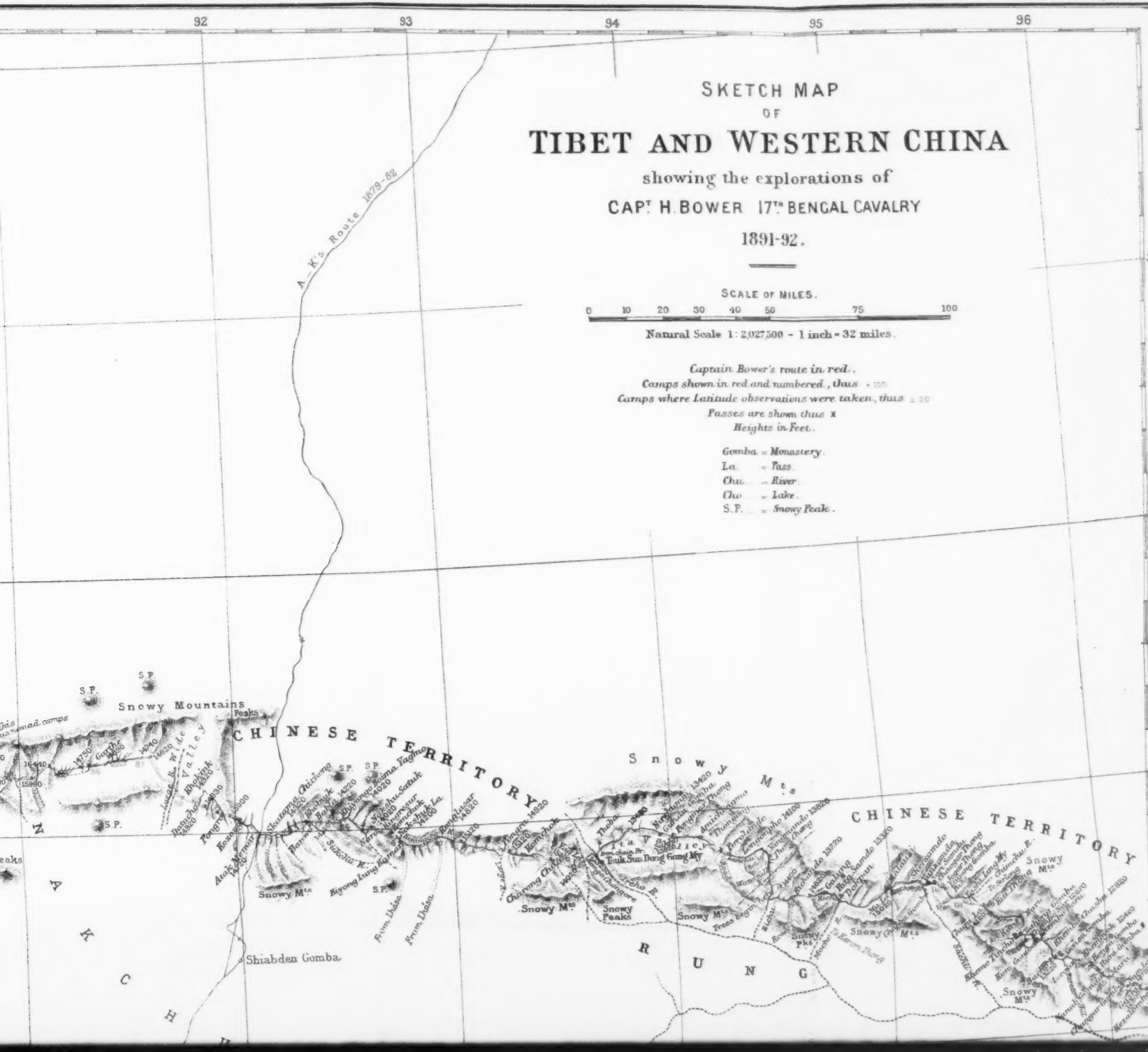
680


92
93
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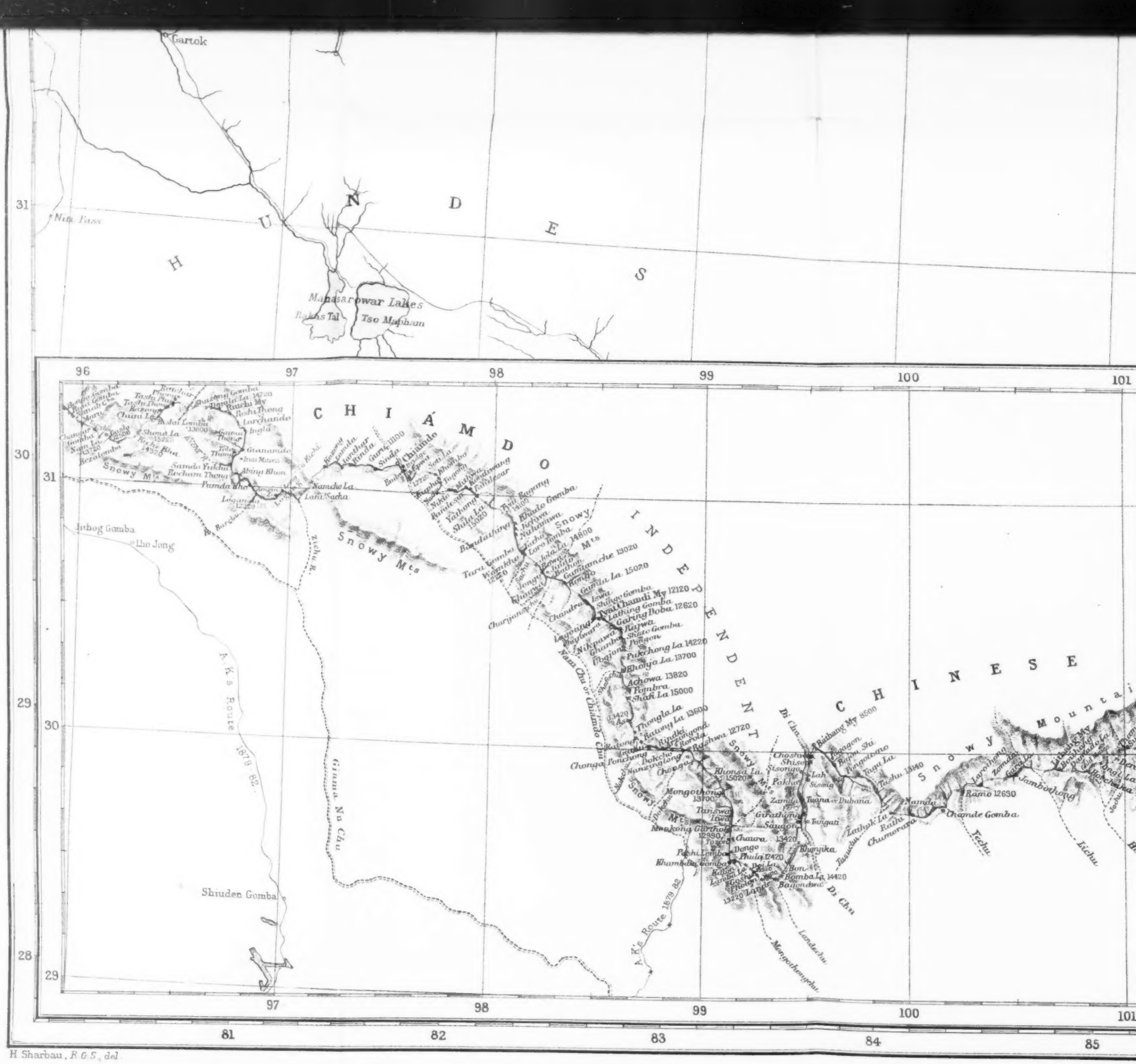
32
31
SKETCH MAP
OF
TIBET AND WESTERN CHINA
showing the explorations of
CAPT H. BOWER 17TH BENGAL CAVALRY
1891-92.
SCALE OF MILES.
0 10 20 30 40 50 75 100
Natural Scale 1: 2,027,500 = 1 inch = 32 miles.
Captain Bower's route in red.
Camps shown in red and numbered, thus ⊕ 100
Camps where Latitude observations were taken, thus ⊕ 20
Passes are shown thus x
Heights in Feet.
Gomba = Monastery.
La = Pass.
Chu = River.
Cho = Lake.
S.P. = Snowy Peak.
A-K's Route 1879-82
Snowy Mountains
CHINESE TERRITORY
Snowy Mts
Shiabden Gomba
From Lhasa
From Lhasa
Snowy Peaks
Snowy Pks
Snowy Mts
CHINESE TERRITORY
Snowy Mts
Snowy Mts
Snowy Mts


Gartok
Mansarowar Lakes
Rakas Tal
Tso Mapham
Nita Pass
H U N D E S
C H I A M D O
INDEPENDENT CHINESE
Snowy Mts
Snowy Mountains
Jubog Gomba
Lho Jong
Shiuden Gomba
A.K's Route 1879 82
Chumra Nu Chu
Di Chu
Lendachu
Mongarchuchu
Lichu
Yichu
Ramo 12630
Chamde Gomba
Bajongaro
Mongothong 13700
Rhonsa La 15020
Bathang My 8500
Chaura 13420
Phula 17470
Ramba La 14420
Baijondma
Tsarowa Tower
Giradhung
Saudor
Tsunga
Dubania
Namda
Jambonla
Lichu
Yichu
Chumaraga
Lathyk La
Rathi
Tsuchu
Zamda
Pakhok
Lah
Sisong
Choshan
Shisong
Tsaga La
Tsaga
Rajongaro
Rajpa Shi
Baigaon
Tsuna
Tsaga
Ponchung
Bakcha
Manzung Gong
Chonga
Rotchewa 12720
Rotchewa
Rotchewa
Rotchewa

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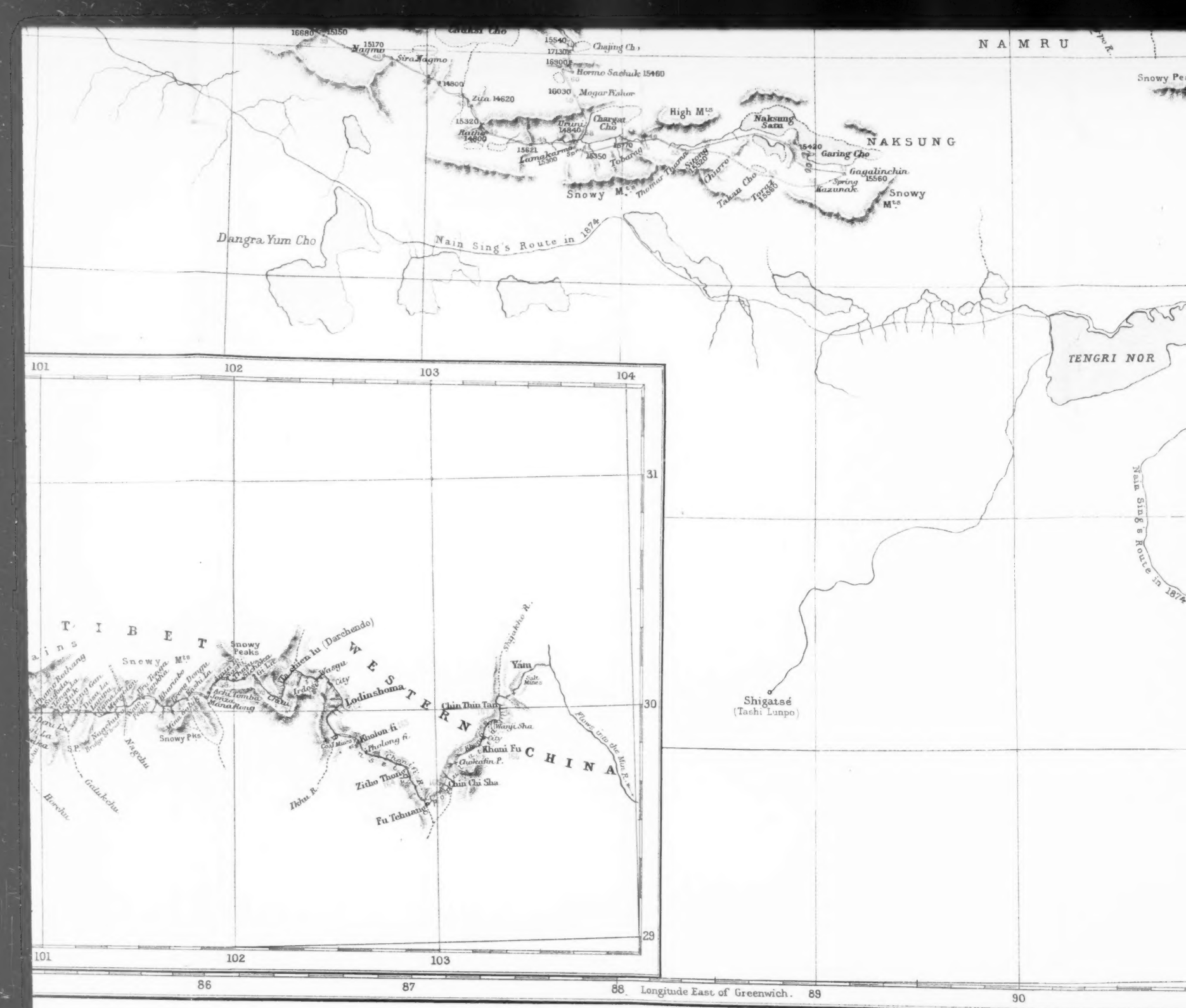

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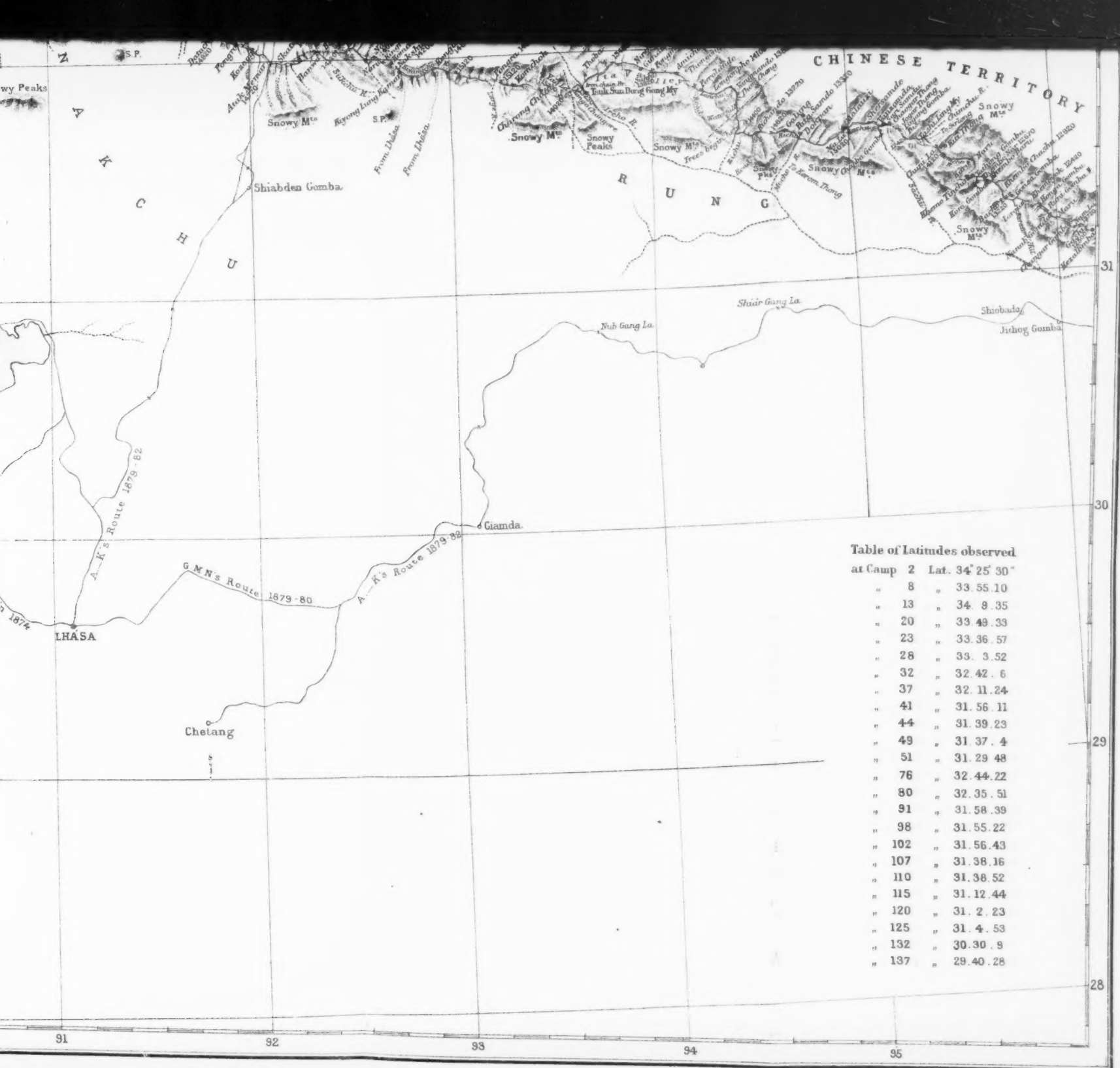
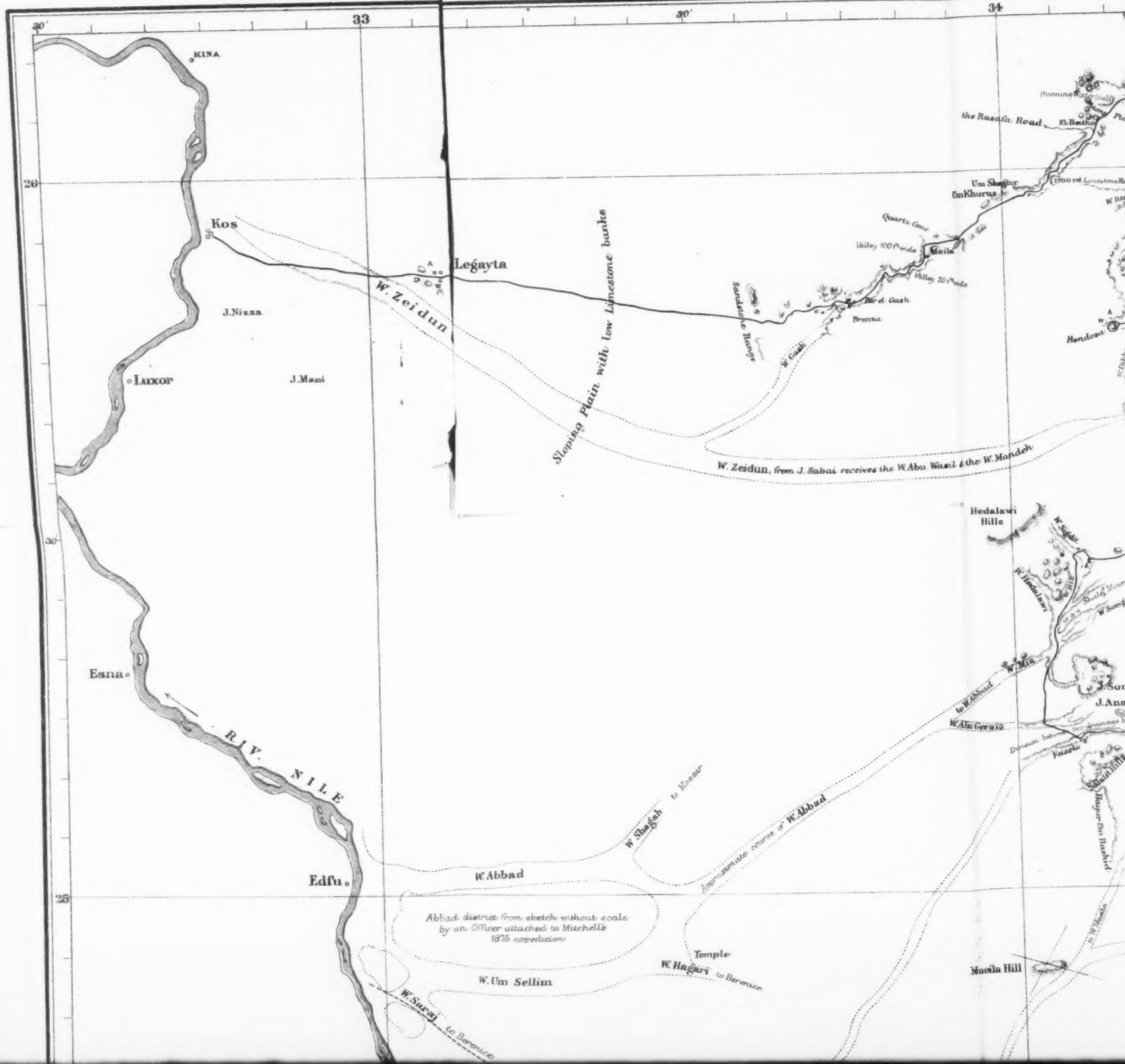
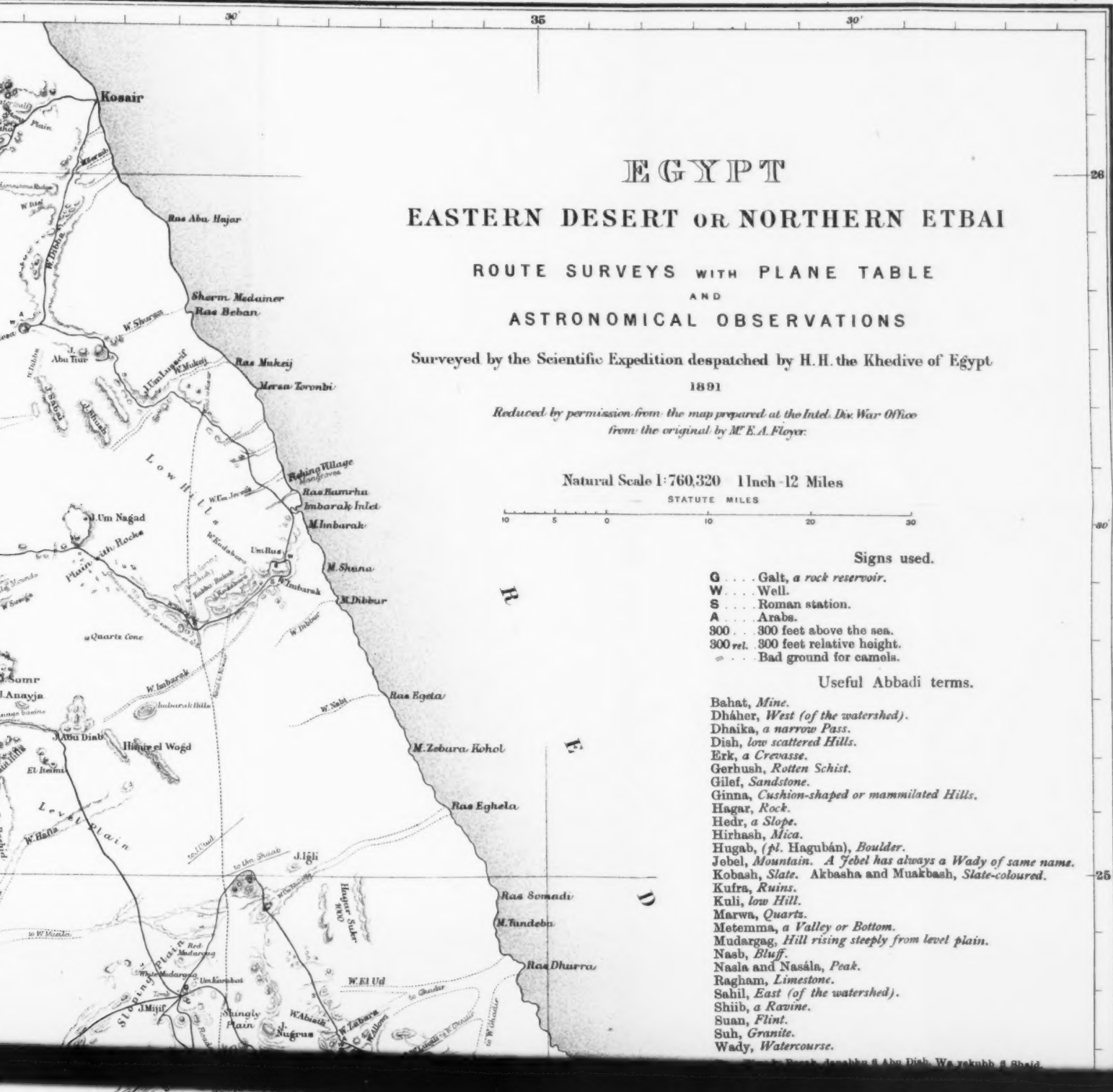


Table of Latitudes observed

at Camp	2	Lat.	34° 25' 30"
„	8	„	33. 55. 10
„	13	„	34. 9. 35
„	20	„	33 49. 33
„	23	„	33. 36. 57
„	28	„	33. 3. 52
„	32	„	32. 42. 6
„	37	„	32. 11. 24
„	41	„	31. 56. 11
„	44	„	31. 39. 23
„	49	„	31. 37. 4
„	51	„	31. 29 48
„	76	„	32. 44. 22
„	80	„	32. 35. 51
„	91	„	31. 58. 39
„	98	„	31. 55. 22
„	102	„	31. 56. 43
„	107	„	31. 38. 16
„	110	„	31. 38. 52
„	115	„	31. 12. 44
„	120	„	31. 2. 23
„	125	„	31. 4. 53
„	132	„	30. 30. 9
„	137	„	29. 40. 28

P.S Weller, *lith.*


33
34
KINA
Kos
Legayta
W. Zeidun
J. Nizza
Luxor
J. Mani
Esna
RIV. NILE
Edfu
W. Abbad
Sloping plain with low Limestone banks
Sandstone Range
W. Zeidun, from J. Sabai receives the W. Abu Wasil & the W. Mandeh
Hedalawi Hills
Abbad district from sketch without scale by an Officer attached to Murchell's 1875 expedition
Temple
W. Hagari to Berenice
W. Um Sellim
W. Sarga to Berenice
Mucila Hill
W. Shagab to Kosar
Approximate course of W. Abbad
the Ruasfa Road
Um Shagur
Um Khuras
Quartz Cone
Valley 100 Feet
Valley 20 Feet
Mucila
Bed. Gash
Breccia
W. Gash
Hendowa
W. Sofeir
W. Hedalawi
W. Mucila
W. Abbad
W. Um Gerafs
Fossils
Bir Ambagi
Bir Nasrani
Bir Hamid
Bir Rauhied
Bir Um Rauhied



EGYPT

EASTERN DESERT OR NORTHERN ETBAI

ROUTE SURVEYS WITH PLANE TABLE AND ASTRONOMICAL OBSERVATIONS

Surveyed by the Scientific Expedition despatched by H. H. the Khedive of Egypt

1891

Reduced by permission from the map prepared at the Intel. Div. War Office from the original by Mr E. A. Floyer.

Natural Scale 1:760,320 1 Inch = 12 Miles

STATUTE MILES

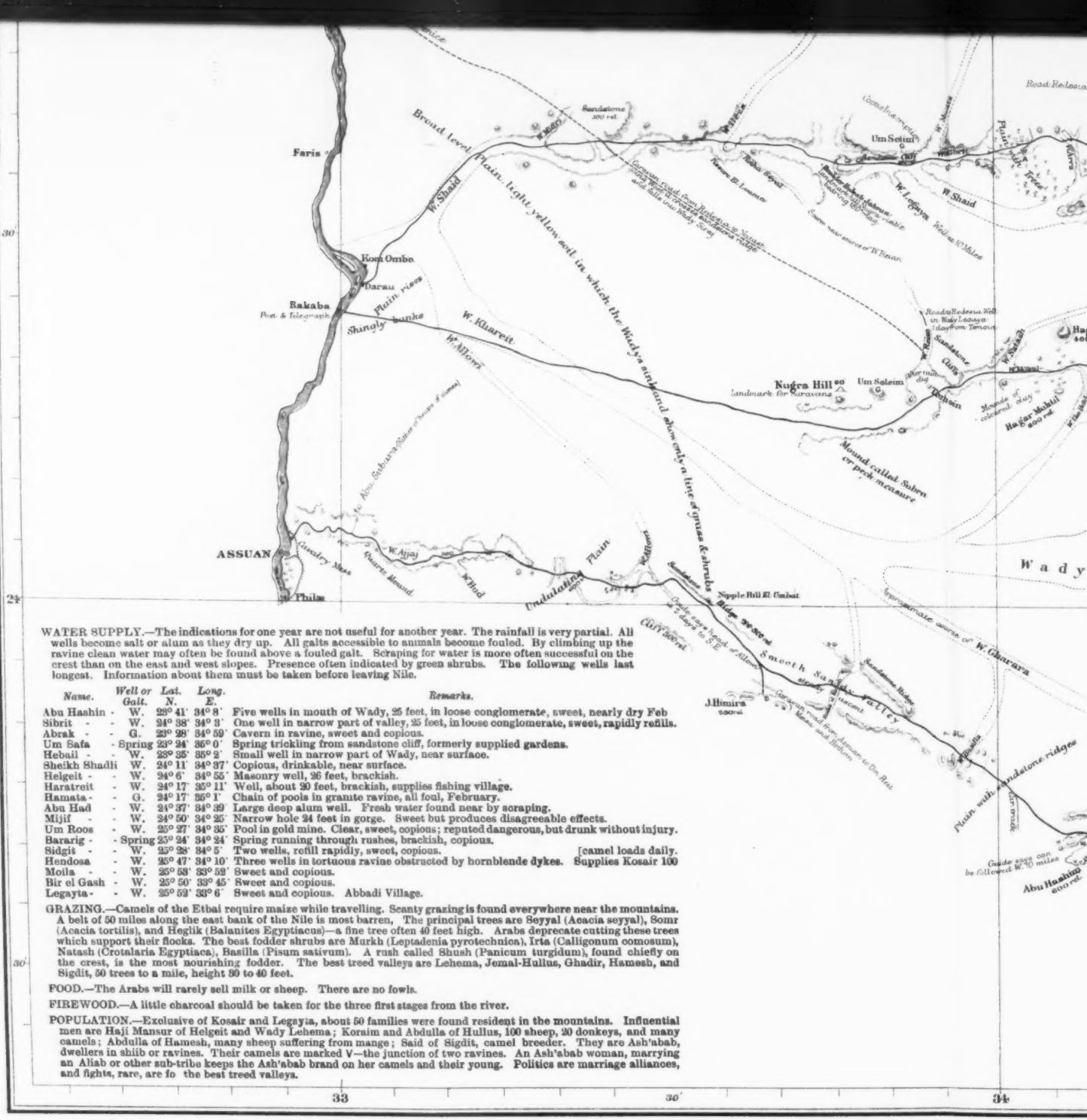
10 5 0 10 20 30

Signs used.

G . . . Galt, *a rock reservoir.*
W . . . Well.
S . . . Roman station.
A . . . Arabs.
300 . . . 300 feet above the sea.
300 *rel.* . 300 feet relative height.
. . . Bad ground for camels.

Useful Abbadi terms.

Bahat, *Mine.*
Dháher, *West (of the watershed).*
Dhaika, *a narrow Pass.*
Dish, *low scattered Hills.*
Erk, *a Crevasse.*
Gerhush, *Rotten Schist.*
Gilef, *Sandstone.*
Ginna, *Cushion-shaped or mammilated Hills.*
Hagar, *Rock.*
Hedr, *a Slope.*
Hirhash, *Mica.*
Hugab, (*pl.* Hagubán), *Boulder.*
Jebel, *Mountain. A Jebel has always a Wady of same name.*
Kobash, *Slate.* Akbasha and Muakbash, *Slate-coloured.*
Kufra, *Ruins.*
Kuli, *low Hill.*
Marwa, *Quartz.*
Metemma, *a Valley or Bottom.*
Mudargag, *Hill rising steeply from level plain.*
Nasb, *Bluff.*
Nasla and Nasála, *Peak.*
Ragham, *Limestone.*
Sahil, *East (of the watershed).*
Shiib, *a Ravine.*
Suan, *Flint.*
Suh, *Granite.*
Wady, *Watercourse.*



WATER SUPPLY.—The indications for one year are not useful for another year. The rainfall is very partial. All wells become salt or alum as they dry up. All galts accessible to animals become fouled. By climbing up the ravine clean water may often be found above a fouled galt. Scraping for water is more often successful on the crest than on the east and west slopes. Presence often indicated by green shrubs. The following wells last longest. Information about them must be taken before leaving Nile.

Name.	*Well or Galt.*	*Lat. N.*	*Long. E.*	*Remarks.*
Abu Hashin	W.	23° 41′	34° 8′	Five wells in mouth of Wady, 25 feet, in loose conglomerate, sweet, nearly dry Feb
Sibrit	W.	24° 38′	34° 3′	One well in narrow part of valley, 25 feet, in loose conglomerate, sweet, rapidly refills.
Abrak	G.	23° 28′	34° 59′	Cavern in ravine, sweet and copious.
Um Safa	Spring	23° 24′	35° 0′	Spring trickling from sandstone cliff, formerly supplied gardens.
Hebail	W.	23° 35′	35° 2′	Small well in narrow part of Wady, near surface.
Sheikh Shadli	W.	24° 11′	34° 37′	Copious, drinkable, near surface.
Helgeit	W.	24° 6′	34° 55′	Masonry well, 26 feet, brackish.
Haratreit	W.	24° 17′	35° 11′	Well, about 20 feet, brackish, supplies fishing village.
Hamata	G.	24° 17′	35° 1′	Chain of pools in granite ravine, all foul, February.
Abu Had	W.	24° 37′	34° 39′	Large deep alum well. Fresh water found near by scraping.
Mijif	W.	24° 50′	34° 25′	Narrow hole 24 feet in gorge. Sweet but produces disagreeable effects.
Um Roos	W.	25° 27′	34° 35′	Pool in gold mine. Clear, sweet, copious; reputed dangerous, but drunk without injury.
Bararig	Spring	25° 24′	34° 24′	Spring running through rushes, brackish, copious.
Sidgit	W.	25° 28′	34° 5′	Two wells, refill rapidly, sweet, copious. [camel loads daily.
Hendosa	W.	25° 47′	34° 10′	Three wells in tortuous ravine obstructed by hornblende dykes. Supplies Kosair 100
Moila	W.	25° 58′	33° 52′	Sweet and copious.
Bir el Gash	W.	25° 50′	33° 45′	Sweet and copious.
Legayta	W.	25° 59′	33° 6′	Sweet and copious. Abbadi Village.

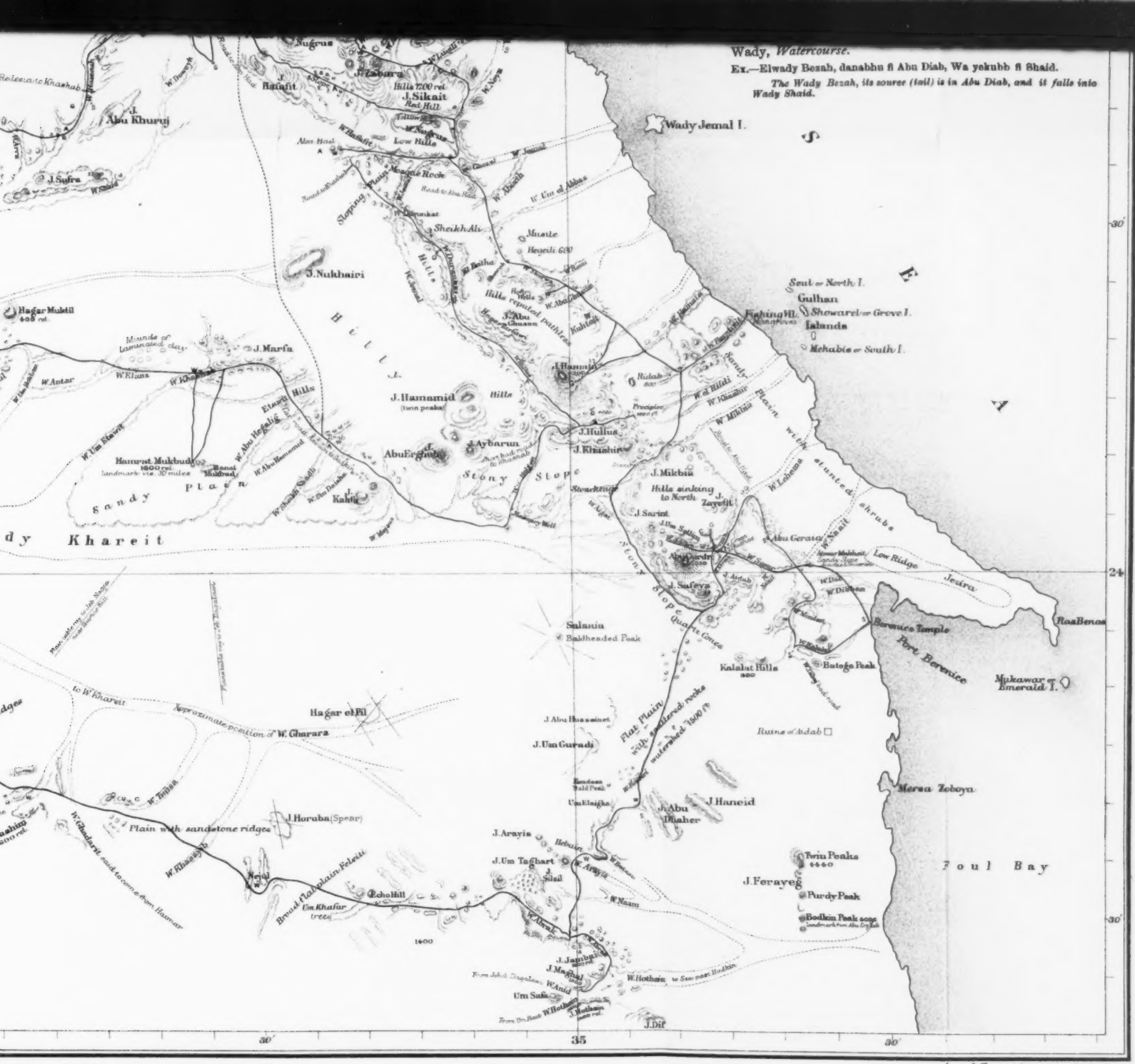
GRAZING.—Camels of the Etbai require maize while travelling. Scanty grazing is found everywhere near the mountains. A belt of 50 miles along the east bank of the Nile is most barren, The principal trees are Seyyal (Acacia seyyal), Somr (Acacia tortilis), and Heglik (Balanites Egyptiacus)—a fine tree often 40 feet high. Arabs deprecate cutting these trees which support their flocks. The best fodder shrubs are Murkh (Leptadenia pyrotechnica), Irta (Calligonum comosum), Natash (Crotalaria Egyptiaca), Basilla (Pisum sativum). A rush called Shush (Panicum turgidum), found chiefly on the crest, is the most nourishing fodder. The best treed valleys are Lehema, Jemal-Hullus, Ghadir, Hamesh, and Sigdit, 50 trees to a mile, height 30 to 40 feet.

FOOD.—The Arabs will rarely sell milk or sheep. There are no fowls.

FIREWOOD.—A little charcoal should be taken for the three first stages from the river.

POPULATION.—Exclusive of Kosair and Legayta, about 50 families were found resident in the mountains. Influential men are Haji Mansur of Helgeit and Wady Lehema; Koraim and Abdulla of Hullus, 100 sheep, 20 donkeys, and many camels; Abdulla of Hamesh, many sheep suffering from mange; Said of Sigdit, camel breeder. They are Ash'abab, dwellers in shiib or ravines. Their camels are marked V—the junction of two ravines. An Ash'abab woman, marrying an Aliab or other sub-tribe keeps the Ash'abab brand on her camels and their young. Politics are marriage alliances, and fights, rare, are fo the best treed valleys.

Published



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